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# United States Naval Institute Proceedings

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First President of the Naval Institute

UNITED STATES
NAVAL INSTITUTE
PROCEEDINGS

VOL. NO. 49, NO. 10 OCTOBER, 1923 WHOLE NO. 248

# FIFTY YEARS OF SERVICE

BY LIEUT. COMDR. ROY C. SMITH, JR., U. S. N.

WITH this issue of the PROCEEDINGS, the United States Naval Institute celebrates its fiftieth anniversary. It seems, therefore, appropriate at this time briefly to review the history of the Institute.

In the fall of 1873, a number of prominent officers of the Navy met at the Naval Academy to consider the organization of an association for the advancement and dissemination of scientific and professional knowledge throughout the Navy. "That our Navy should have a professional forum, similar to the Journal of the Royal United Service Institution (British) was generally recognized." It seems probable that this idea, from which the Institute has grown, sprang from the brain of Commodore Foxhall A. Parker, and that he must have had the cordial endorsement of the then Superintendent of the Naval Academy, Rear Admiral John L. Worden. He also had the enthusiastic cooperation of such members of the Academic staff as Commander Edward Terry, U. S. N., later Commandant of Midshipmen, Chief Engineer C. H. Baker, U. S. N., Captain McLane Tilton, U. S. M. C., Medical Director Philip Lansdale, Pay Inspector James D. Murray, Lieut. Commanders P. F. Harrington, J. E. Craig, Commander S. Dana Green, Lt. Commanders C. F. Goodrich, P. H. Cooper, and C. J. Train.

The activities of these officers resulted in a meeting on Thursday, October 9, 1873, at which Rear Admiral Worden presided. The objects of the association were stated, the name, United

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States Naval Institute, was adopted, and the organization launched on its career of service to the Navy and to the Nation. At this meeting Commodore Foxhall A. Parker read a paper on the Battle of Lepanto. This was the first paper read before the Institute. It was not published in the PROCEEDINGS, however, but appears to have been published elsewhere.

The new Institute at once secured the cordial approval and support of officers in Washington, such as the Admiral of the Navy, David D. Porter, Commodores Daniel Ammen, C. R. P. Rodgers, and Commander J. C. Howell. In the early affairs of the Institute, as was to have been expected, Captain, later Rear Admiral, Stephen B. Luce, was ever to the front. In December, 1873, thirty-six names appeared on the rolls, and of those the following three survive: Rear Admirals P. F. Harrington, C. F. Goodrich, and J. E. Craig. By the end of the first year, the membership had grown to sixty-nine, and of those three additional survive, namely: Rear Admirals F. J. Higginson and W. H. Brownson, and Professor N. M. Terry. These officers may well be regarded by us, their successors in the Institute, as our "Elder Statesmen."

When first organized, the Institute held monthly meetings at which papers were read. The first number of the PROCEEDINGS was issued in 1874 and contained a paper read by Captain S. B. Luce, U. S. N., at the meeting held November 13, 1873, entitled "The Manning of our Merchant Marine." From that date the PROCEEDINGS have continued to be published; at first quarterly, then bi-monthly, and now monthly.

The Constitution at first adopted provided for a Patron, who was the Secretary of the Navy, at that date the Honorable George M. Robeson; a President, the Admiral of the Navy *ex-officio;* a Vice-president; a Council of Regents consisting of the chiefs of the Bureaus of the Navy Department and the Commandants of shore stations; an Executive Committee corresponding to the Present Board of Control; a Recorder and Treasurer; a Secretary; and a Committee on Printing and Publication of Papers. Many of these offices have been discontinued, notably those of Patron and the Council of Regents. The Executive Committee and the Committee on Printing and Publication of Papers appear to have consolidated into the present Board of Control; and the other offices

consolidated into the office of Secretary and Treasurer, to aid whom a new office, that of Assistant Editor, has recently been established.

For the first year, the office of President was held ex-officio by the Admiral of the Navy, David D. Porter. His locum tenens at the Naval Academy, which has ever been the seat of the Institute, was Rear Admiral John L. Worden, then Superintendent. The next year, in 1874, Admiral Worden succeeded to the office of President, which then ceased to be an ex-officio office. The first Vice-president was Rear Admiral C. R. P. Rodgers. The first Recorder and Treasurer was Chief Engineer Charles H. Baker, U. S. N., and the first Secretary, Professor James Russell Soley, U. S. N. A.

At the outset it was planned that the Institute would have branches at all shore stations, and also on all sea stations, home and foreign. Hence, a President at Washington was the proper thing. During the course of the first fifteen years of the life of the Institute, the branches elsewhere than Annapolis appear to have dissolved, the New York and Washington branches outlasting the others. The work was accordingly concentrated at the Naval Academy, where it had been started, and more attention was given to the publication of papers in the PROCEEDINGS than to having them read before a meeting. Meetings, nevertheless, continued to be held regularly until about 1895 or 1896, and at intervals thereafter at which papers were read prior to publication. Since that time, only rarely have papers been read, but of course the annual business meetings have always continued to be held. As a recognition, perhaps, of the vital part the Naval Academy has played in the life and growth of the Naval Institute, the Superintendent of the Naval Academy has almost always served either as its President or Vice-president.

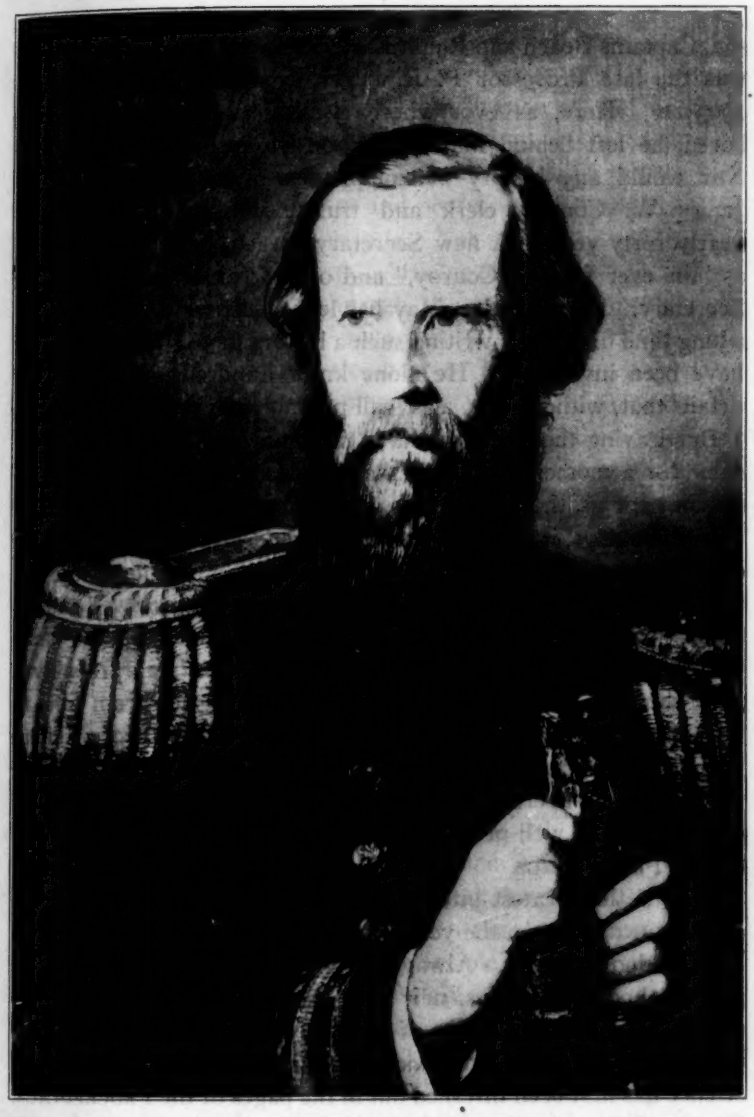
The membership of the Naval Institute, as first recorded, in December, 1873, consisted of thirty-six officers. At present it consists of 143 life members, 4008 regular members, who are or were at the time of joining, officers of the Navy, Marine Corps, or Civil Officers attached to the naval service, and 497 associate members, officers of foreign services, the Army, the Coast Guard, the Naval Reserve Force, and civilians interested in naval affairs; and four honorary members, the President, the Secretary and

Assistant Secretary of the Navy, and President-Emeritus Charles W. Eliot, of Harvard University. This total membership of 4652 shows the healthy growth of the Institute since its founding with thirty-six members in 1873.

The magazine, the PROCEEDINGS, has been published regularly since 1874, and has always held high rank among the professional magazines of the world. It is sent, either by subscription or exchange, to nearly all countries, and in particular to all boasting of navies. As a side line to the publication of the PROCEEDINGS, and in conformity with the object of the society, the dissemination of scientific and professional knowledge throughout the Navy, the Institute in 1898 took up the publication of books on naval and allied subjects, the first being *The Log of the Gloucester* and Fullam's *Instructions for Infantry and Artillery,* published in 1899. These books are largely those used as text books at the Naval Academy or as reference or drill books in the navy at large. The list is now extensive, and embraces well known works on Navigation, Seamanship, Marine Engineering, Ordnance and Gunnery, Electricity, Radio Engineering, and other professional subjects.

In considering any history of the Institute, one may well be struck by the caliber of the officers who founded and who carried on its work. The founders have been mentioned. Prominent among those who have carried on the work thereafter are Rear Admirals Sampson, Jenkins, John Rodgers, C. R. P. Rodgers, Edward Simpson, H. C. Taylor, Richard Wainwright, Caspar F. Goodrich, and others who served as President. Rear Admiral Goodrich has ever had a great interest in and influence over the affairs of the Institute, as have had Admirals Fiske, Sims, Knight, and others. The Prize Essays, established in 1879, have brought out a wealth of valuable material and useful precept, and their authors, among them most frequent, Luce, Mahan, Goodrich, Schroeder, Richard Wainwright, Fiske, Niblack, W. L. Rodgers, Alger and many others, include a galaxy of leadership, and of authority in their profession, such as few other comparable magazines can boast.

Many able officers have served as secretary. Among these may be noted Professors Hendrickson and Charles E. Munroe, Rear Admirals Sampson, Wainwright, H. S. Knapp, Eberle, and Jack-



CAPTAIN J. L. WORDEN, U. S. NAVY

(From an oil portrait by A. Gliemann, in Academic Board Room, U. S. Naval Academy)

Superintendent of Naval Academy at the time of the founding of the Naval Institute, 1873. Second President of Naval Institute (1874)

son, Captains Beach and Ralph Earle. Longest in point of service was the late Professor P. R. Alger, who filled the post from 1903-12. Here, as everywhere else this astonishing man labored, he left behind him a tradition of unsurpassable service. Nor would any history be complete without mention of Mr. James W. Conroy, clerk and trustee for the Institute for nearly forty years. A new Secretary, Beach, once spoke of him as "the ever faithful Conroy," and of his value to the incoming Secretary. His death last May has left a deep void which will be a long time filling. In writing such a history as this his help would have been invaluable. He alone knew hundreds of interesting details that, without him, alas, will probably never be brought out.

But leaving the men who have made the Institute, let us consider for a moment the work that they have done, and what yet remains for us, their successors, to accomplish.

In these days, it is the rule always to set a *mission* when starting out to do anything. It would not appear that any definite mission was, in this case, set as such. It was, however, very well understood what the Institute was for, which amounted to the same thing. The lack of a definitely worded mission was probably a good thing, as it has permitted the papers published from time to time to treat of the various pressing subjects as they arose. There was always an object, mission, if you will, but always it has been so broad, that papers on almost any subject, scientific, professional, or historical, if well presented, would find room within the pages of the PROCEEDINGS.

It is of the greatest interest to look back on the files of these PROCEEDINGS. From the very beginning we find plainly evident a forward looking view. Always writers are looking ahead, seeking new methods, new ships, new guns, new ideas for the manning, the supply, the development of the Navy. It is scarcely too much to say that every advance made by us in any branch of naval science has first been threshed out in the pages of the PROCEEDINGS. We can follow the development of the battleship from the post-civil war type of glorified monitor to the present *Colorado*. We can follow the arguments for and against the all big gun battleship, and how strangely they fall on our ears now! We can follow the introduction of oil as fuel, the introduction of turbines, and finally of the electric drive. We can follow improvements in fire

control, in spotting, in gun laying, from the first stirrings of dissatisfaction with then existing procedure up to the present director methods of gun laying, with aerial observation of fall of shot. It is scarce too much to say that, with the possible exception of the War College at Newport, no other source has so greatly furthered the material development and professional advancement of the Navy as has the Naval Institute. Nor should we entirely lay stress on material advancement. Articles of historical and scientific note are scattered all through the files. The mental and professional needs of the personnel have been served fully as well as has the material development of the Navy. Indeed, to anyone interested in the development of our own Navy, or that of foreign navies as well, the PROCEEDINGS may well be regarded as indispensable. One need hardly go outside them for data on this subject. Surely the founders must hold that the Institute has more than justified itself. Surely we may hold that every officer in the Navy should be a member; that every midshipman should join upon graduation. Professor Alger's advice to graduates was, always to take up a specialty; and he advised them further that in no other way could they keep in touch with their profession save by careful study of the progress marked out in the PROCEEDINGS.

The continued value to the service and to the country of the Institute is largely bound up with the question of censorship, or departmental muzzling. This is a most delicate subject to tackle, but one that must be faced squarely and honestly. In the words of Flammarion, "Free and loyal discussion is necessary to conquer the Truth," and Voltaire (was it not?) "I wholly disagree with what you say, and shall defend to the death your right to say it." We also must uphold this principle. Fortunately we are removed from the days when a distinguished officer of the Navy was forbidden to print in the PROCEEDINGS an article, every statement of which was derived from the Secretary's annual reports and other documents already published to the world at large; those same days when another distinguished officer was forbidden "even to say that two and two make four."

Relations today with the Department are most cordial and sympathetic but the future is as a curtain through which we cannot see; and in this connection, part of a letter from Admiral

Goodrich may well be quoted and preserved as a guide to our successors.

> . . . . we should all clamor for the desirability of an officer's speaking out at will. For myself, both as President of the Institute (and therefore officially) and at other times, I have verbally and in writing urged various Secretaries of the Navy to remove all restriction on the Institute publications, averring that no officer would abuse the privilege by printing anything confidential in nature. "Encourage all, especially the youngsters, to blow off their steam," I would say. "If any individual should be guilty of personal attacks or of improper language and motive, punish him for conduct unbecoming an officer and gentleman, or whatever the offense may be. But eliminate all censorship, and don't shut up the open discussion of service and naval policy topics." And I added, "Doubtless much of this material will be useful only in letting a chap unburden his mind, but occasionally the Department will get a suggestion of importance which would never reach it through routine channels."

Admiral Goodrich's view is one that we cannot but subscribe to, all of us, and the Institute should ever tactfully and gracefully work to that end. Within recent memory times have arisen, and they may arise again, when we shall have to fight for this principle. Then, like Admiral Sir John Fisher, we can't be silent, and we must not lie.

The Naval Institute of the past has lived up to this principle. It has faced its problems squarely and honestly. That in the future it shall do no less we may confidently assume. And there are problems yet to face. Those confronting the Navy of today are fully as great as, if not greater, than those of the past. Where the past was concerned first with preventing dry rot from attacking the Officer Corps, then with the up-building of the fleet, today we are concerned with the maintenance of the fleet as settled by international agreement, with the utilization and training of this fleet, and with the education and training of its officers and men. These problems are tremendous. In view of the increasing importance of the external relations of the Nation, which the Navy serves, they cannot but be considered fully as vital as were the earlier ones of growth and development. As in the past, so in the future. Toward the solution of these problems the Naval Institute, with all the intelligence it can command, must ever strive.

# ATHLETICS, BENEFICIAL AND OTHERWISE

By Rear Admiral A. P. Niblack, U. S. Navy

IN CONJUNCTION with the Army, the National Collegiate Athletic Association, U. S. Lawn Tennis Association, Boy Scouts of America, Y. M. C. A., and the American Physical Education Association, the Navy has just joined the recently-organized National Amateur Athletic Federation of America. Many other organizations will undoubtedly join later. It is by far the largest federation of athletic bodies yet brought together and will unquestionably do much for the betterment of athletics not only in this country but in other countries by example and precept. Its object is to aid the organizations of which it is composed in their efforts to improve and place wholesome physical activities within the reach of all; to improve athletic methods and to educate the public in general as to the value of physical training; to adopt, formulate and publish the principles, standards and rules governing games and events; to encourage all forms of amateur athletics and pastimes and to stimulate local, sectional, and national championships; and, finally, to foster interest in the International Olympic Games, encouraging the participation of representatives of the United States in these events. Unquestionably this is a long step forward and good only can come of it, but it is well to make sure that *only* good can come of it.

Not all physical exercise is necessarily beneficial. The vice of the Turn Verein system has been the development of "stunt" performances for show purposes, tending to develop participants exactly where not needed. The fault of the Swedish system, as excellent as it is, has been that those who have not needed elementary exercises have had to take them along with those who did, and it has thus been too irksome in the beginning. This may, however, easily be corrected, as will be shown. The fault of all athletics and competitions in general is that those who participate do not really need the exercise for their health, and it is the people on the bleachers watching athletic exercise who really do.

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With this problem of getting the onlookers to participate is also the bigger problem of not permitting injury to result from injudicious exercise. The large investments of money in athletic and gymnasium outfits in schools, colleges and other institutions represent an outlay of money for which there is absolutely no adequate return, simply because those who need the gymnastic apparatus most do not get it, do not know how to use it, and are as apt to injure themselves in using it as to get benefit from it unless carefully and intelligently supervised. A parent who sends a son or a daughter to a school where there is a gymnasium and physical training should at least be assured that no harm will be done as well as be made to feel that positive good will result.

I speak advisedly when I say that the U. S. Naval Academy has the best system of physical training of any institution in the world and that, in certain respects, it is capable of still further improvement. As it is more or less "fool-proof" in its benefits physically, and, as very few of the older officers in the Navy are familiar with the present Naval Academy system of training, it will not be out of place briefly to explain it.

The physical training at the U. S. Naval Academy consists of (1) strength requirements, (2) gymnasium requirements, and (3) swimming requirements. The strength requirements include all tests on the strength-testing machine, and ascertaining and correcting defects in particular muscles and groups of muscles, in weight, and in posture. The gymnasium requirements include tests in football, baseball, crew, track and field, basketball, boxing, wrestling, lacrosse, fencing, gymnastics, water polo, tennis, soccer, handball, training, practical gymnasium work, setting-up exercises, companion exercises, rough and tumble, and leadership. The swimming requirements are for various distances, strokes, methods of swimming and methods of resuscitating and life saving. Roughly they are grouped into Class "C" for the fourth class, "B" for the third class, and "A" for the second class, while the first class, or last-year midshipmen, devote themselves to a selective course in athletic subjects from the coaching point of view, especially with a view to being expert coaches in at least two sports and umpires in as many sports as possible, when they go out into the service after graduation.

There is a great deal of misunderstanding as to the value, pur-

pose and limitations of the strength-testing machines, or dynamometers, which are used in the Naval Academy preliminary to any form of physical training or exercise. When the new gymnasium at the Naval Academy was completed in 1908 I happened to be in command of "Ships, Naval Academy," and, on my recommendation, two Universal dynamometers were purchased and installed in February, 1909, in the new gymnasium, I being permitted to instruct the gymnasium officers and civilian assistants in the method of manipulating the machines and making tests of the nine groups of muscles of each arm, the eight groups of muscles of each leg, and the five groups of muscles of the trunk and neck. From results of the tests of several thousand young men tables are prepared which give what the average person of a given height should be able normally to exert with each particular group of muscles. The tests are so arranged that each group is isolated in the test so that it cannot be assisted by any other group. As a result of the test, which only takes about twenty minutes, the groups of muscles in which the individual exceeds or falls short of the average are graphically shown on a tabulated form. Opposite each group of muscles there are numbers corresponding to apparatus in the gymnasium by which the particular group of muscles that are defective may be exercised. There are also printed, on the back of the tabulated form, instructions as a guide to other methods of correcting certain defective groups of muscles.

Before discussing the significance of these tests, the main point is that those who do not pass the test satisfactorily are not permitted to sit on the bleachers and watch other people play until they have brought their groups of muscles up so as to pass the testing machine satisfactorily. They belong to the "weak squad" and the punishment is thus made to fit the crime. This, however, is not done as a punishment but *to prevent the individual from being injured later on by physical exercise.* It is essentially protective to the individual. This testing machine takes the place of all the elementary stages of the elaborate Swedish system in that the weaknesses of the individual are pointed out by the machine and he need individually develop himself only where he is lacking. It is thus the *a, b, c* of the Swedish system and merely brings the individual from minus up to zero. It is not a system of training.

It merely brings the individual up to the point where the testing machine automatically says, "Take him. He is not now in danger of being injured by whatever system of training you are to use on him, Swedish or other." One may look over the strength test cards and almost automatically select recruits to try out for the crew, for football, wrestling, boxing and sports in general *where strength, and not running,* is required, for runners seem to be born and not made. Of course, the real way to select candidates is by their demonstrated qualifications on the athletic field; but, the main point is that no individual is permitted by a coach to serve on a team until after passing the testing machine, thus showing that he does not possess, for the time being at least, any group of muscles much below par whether through concealed injury or some temporary cause. As between two candidates for some position on a crew or track, the machine might indicate which individual is preferable, except that the machine distinctly gives no tests which have any relation to *endurance.* The testing machine is simply an adjunct of the gymnasium and of athletics which, in a few minutes, automatically hands out its verdict as to the fitness or unfitness of the candidate to undertake physical exercise, and does away with guess work, "expert" opinion, and "professional" omniscience. To the defective it infallibly guides his exercise to the development of the weak groups of muscles.

It is a pity that athletics, being competitive, encourages over-development in the very things that the individual needs least or possesses an undue share thereof. There is, in this new Federation, a splendid opportunity for instructors, organizations, and collegiate authorities to discourage over-development and to get the people off the bleachers into some beneficial, amusing and stimulating exercise. This, to be attractive, should take the form of simple sports. To a person on the bleachers, or in a reserved seat, there is something very discouraging in the perfection of the athletic prowess they are so comfortably witnessing. What, therefore, is needed, is a slogan, "Sport for the Dubs."

At the Naval Academy the competition in athletic exercises is carried out between classes, companies, battalions, and brigades, and with outside colleges, so as to get as many individuals interested as possible. Over eighty per cent of the midshipmen thus take part in some form of competitive sports, and less than twenty

per cent are "bleacher sports" who "let George do it" for them while they root. It was a very fortunate thing that the installation of the testing dynamometers in the Naval Academy gymnasium coincided with the change whereby the newly-entered class at the Naval Academy did not go out on the practice cruise but spent the summer at the Naval Academy, because it gave the opportunity to establish the strength requirements and the present splendid system in general, which is briefly as follows:

## I. Strength Requirements

After the "Plebe" class enters in June, it has the Naval Academy all to itself. After getting into uniform, being assigned to companies, and other preliminaries, the gymnasium part of the training comes along, consisting first in the testing of the forty-two groups of muscles on the dynamometer. Defects in weight as well as in groups of muscles are noted. Those who pass are next examined by the medical officer as to "posture" and he points out defects in carriage and explains how to correct any faults. "Posture" is standing at "attention," head up, neck vertical, chin in; shoulders square, evenly balanced, and falling naturally; chest out and arms straight downward; abdomen in and hips back; knees together and heels together, feet turned outward equally and forming an angle of forty-five degrees. The medical officer keeps an official copy of each of the strength test cards and the "posture" cards, but each midshipman makes a copy for himself in order to assist in correcting faults. Errors in "posture" are regarded as part of the strength test requirements for the first year at the Academy, but in the second and third years they become part of the gymnasium requirements. It is in connection with this particular correction of "posture" that great improvement can be made, as will be shown later in this article, it being the real reason for which it is written. It is interesting, however, to follow the midshipmen through the course.

Following the strength test, midshipmen are required to fill out a printed card showing their athletic record before entering the Academy; what particular sports participated in and in what capacity; records made; any injury received; and what sports desirous of taking part. On the back of this card are blank spaces for entering future data as to athletic accomplishments at

the Academy. This card is for statistical purposes and is not used in assigning special training. While certain midshipmen are being put through the above test others are taking their first swimming requirement tests as given on a swimming requirements card.

### II. Swimming Requirements

Swimming requirements are under two heads, practical swimming and swimming as a sport. The swimming requirements card contains a certificate which the midshipman has to sign in case he cannot keep afloat. In that case there are no practical tests. The lowest qualification is "D," "Can keep afloat." "C" qualification is swimming or keeping above the water for five minutes and ability to demonstrate the breast, side and back strokes. The "B" qualification is to swim 120 yards in three minutes and thirty seconds, using the breast, side and back strokes each for forty yards. Besides this, diving into the water and raising an object from the bottom of the tank. The "A" qualification is swimming 160 yards in four minutes and thirty seconds, using the breast, side, back, and either the trudgeon or crawl strokes each for forty yards; to approach a drowning person and to swim with him twenty yards to a place of safety; and to demonstrate ability properly to apply methods of resuscitating a person apparently drowned. The "C" requirement is the one which *must* be accomplished in the first year at the Academy, "B" in the second year and "A" by at least the end of the third year.

### III. Gymnasium Requirements

The standard gymnasium requirements are the same for the first two years at the Naval Academy. Each midshipman is given a card of "gymnasium requirements" on which are entered, from time to time, their status on each particular form of sport and what progress is being made. The card contains a list of "practical gymnasium tests" which determine their ability to use the various groups of muscles. These embrace the bar vault, standing broad jump, running high jump, dips on parallel bars, chin on horizontal bars, rope climbing, making fast on single rope, short horse, throwing medicine ball, mounting on shelf, running 440 yards, horizontal bar, wall bar and tumbling. The other gymnasium requirements entered on this card are knowledge of and

participating in football, baseball, rowing, track and field, basketball, boxing, wrestling, lacrosse, fencing, gymnastics, water polo, tennis, soccer, handball, dancing, training, setting-up exercises, companion exercises, rough and tumble, leadership, and postures in movement, called "Posture for stride." Instructions are given in rifle shooting, in golf, and in a number of other things outside of actual gymnasium requirements. In the strength test, in the "Plebe" year, ten defects in requirements are permitted; in the second year only six are permitted; none are permitted in the third year, and the gymnasium requirements are doubled in severity in the third year to complete the course, because in the final year there are no requirements other than posture, general physical exercise, elective courses, and coaching and umpiring. The setting-up exercises which are given to all midshipmen for fifteen minutes at the beginning of each drill period are on the Swedish system. Marks in military character are assigned to all midshipmen coming under the observation of instructors in physical training. The teaching in leadership is in voice, posture, self-reliance, poise, initiative, etc.

There is a book published by the U. S. Naval Institute which each student has to have as a textbook, called *The Manual of Athletic Requirements,* profusely illustrated, containing all the points on coaching for the various games and explaining all the various tests used at the Naval Academy, price $3.50.

For schools or military organizations in which discipline is effective, the system which is used at the Naval Academy can be put into effect with excellent results. In an article in the *Army and Navy Journal* of September 3, 1921, Lieutenant Colonel Herman J. Koehler, Master of the Sword, U. S. A., says: "For the first time in the history of the U. S. Military Academy, athletics, in contra-distinction to the course in physical training there, have been officially recognized as a part of the regularly prescribed curriculum. Every company contingent is in charge of a coach, or officer, who remains with the company team until the close of each period. Every prescribed activity has an officer in charge of it, who has complete charge and is held responsible for everything pertaining to his particular activity. Sixty officers are required to supervise this instruction." West Point has been a little slow getting started but has evidently gone in for it wholesale.

Lieutenant Colonel Koehler states that it was brought about by the realization of the physical unfitness of so many recruits who were called to the draft for the war. One out of every three was rejected as unfit, and, of those who were accepted and sent to the various camps, "it became very apparent that the majority had never had any physical training whatsoever. It became necessary to turn these camps into huge athletic and physical training centers in order to fit the men so that they would be able to go on with the ordinary military training."

The problem this country is facing is briefly this. The right to vote, in the case of the male citizen, implies the obligation to bear arms in case of national necessity. One-third or more escape the draft because physically unfit. Many of those accepted are not fit enough to go into war training. What do?

To my mind the National Amateur Athletic Federation of America offers the best opportunity for a national campaign of education. Schools will help, cities will help, states will help, and the Government will help if the remedies are understood, are well formulated and are practicable. We are not a decadent nation and we love sports, but it is not against any laws to be physically unfit, except the laws of nature, and, even at that, some children are born unfit. Here we arrive at the root of the matter. We must start with the children, concentrate on the youth, and merely "salvage" what we can of the grown-ups.

First, as to children. In all children's schools the young pupils should have corrective medical supervision. The astounding adaptation of the heart in children to the strain put upon it, points to the fact that jumping, walking and running, with a few corrective exercises in posture, and correction of physical defects, are all that should be undertaken with children, except light calisthenics to music if desired. It is not a good thing to develop muscle in children, and walking, jumping and running are sufficient to preserve health and develop the frame (skeleton). I am a patron of a clinic in London, England, for the free treatment of spinal curvature in children. The question arises at once in connection with medical attendance in children's schools as to how funds will be provided for it. While this is a problem for each community, it should be the main business of the newly-organized National Amateur Athletic Federation of America to take this matter up as

its fundamental problem, because it begins with children. The question of who is to pay for it is the real issue.

The best results in physical training take place during youth, because the natural growth and development can be powerfully aided and directed in building up a perfectly-formed and healthy body by reasonable supervision. The neglect of proper exercise at this period frequently results in a flat chest, round shoulders, poor physique, clumsy and ill-controlled movement, with a sequel of organic weaknesses, predisposition to disease, and lack of efficiency in the struggle of life. *Moreover, these defects are very little amenable to physical correction when commenced later in life, and the problem then becomes one of using artificial supports for their correction.* In countries where they have military conscription, it is to the government's interest to correct defects in boys and young men, in order to prevent their being excused from the draft on account of physical unfitness. The argument here advanced is that boys and girls alike should get the benefit, and not the males only. Otherwise, we might say that conscription should be adopted in this country in time of peace. One of the great arguments in favor of competitive sports, aside from the physical benefits accruing, has always been their influence in teaching obedience and discipline, and the further advantage of bringing participants into close contact in an athletic democracy, engendering mutual respect between people in different walks of life, and being a good preparation for personal contacts afterwards in business life. It is an infallible antidote for social snobbishness.

For instance, in England, there are two great divisions of sports, those that consist in the pursuit of game, and those that consist in competitions for superiority, either of individuals or of groups of players. It is this love of both forms of sport that makes the young Englishman content to live a rather solitary life in remote corners of the world, with sports as an occupation for his leisure hours, instead of relying on the boulevards, cafés, moving pictures, theaters, and consolations among natives. In athletic sports, some demand careful physical training for the sake of a single effort which is often over in a few minutes. Others do not require more than the average condition of a healthy man. This is one reason why cricket has such a hold on English life. It is a gentleman's game and does not bring one in contact with one's inferiors

socially; it does not require special physical fitness in either the old or the young; and it is a game which promotes individual prowess through sometimes taking several days to play a game. There is not enough decisive action in it to suit the average American and it is essentially not a democratic game. One may play cricket to a good ripe age, but you are finished for most popular American sports at forty, except perhaps golf. There are more outdoor games in England less violent than with us, like bowls, croquet, archery, etc., which give recreation and exercise, and "sports" are more a popular fad than with us. They rather pride themselves on not going in for sports "just to win," and look down on "coaching" as something to be discouraged. They seem to *feel* that somehow they will eventually win without special methods, as England is "the home of sports," and the average Englishman is above the average elsewhere in physical stamina. It is, however, an unfortunate fact that England is lagging in the adoption of modern methods of physical improvement. Nothing, however, is so dangerous as the spirit which sometimes dominates sport, as illustrated in an article in the London *Daily Mail*, June 19, 1922, entitled, "Why Our Boxers Win Abroad." In speaking of the number of boxers that had gone to the United States the article says: "They were all good before they said farewell to England but they were nothing like so good as they were after they reached the United States. What is the reason? It is not easy to discover. Has pride of race anything to do with it? Is the same true of the comparatively unsuccessful boxers who, without much reason, bound into prominence when they appear in American rings? It cannot be the climate; it cannot possibly be that an entirely new standard of skill is suddenly acquired." It is really scientific training and up-to-date methods which produce athletes rather than either race or climate. The strides which are being made in athletics in Japan, China, and the Philippines, under the intelligent direction of American instructors, will soon convince both America and England of this. We are, in fact, on the eve of a great awakening in athletics and all that science can teach will have to be enlisted in the movement.

In athletic competitions it has been customary to select "off the top," those who have arrived there somehow. The Naval Academy method is to build from the very bottom by training each

individual and select competitors from the overflow at the top in accordance with George Ade's well-known motto, "In uplifting get underneath." The method which obtained a few years ago in many colleges and universities of scouring the preparatory schools for promising athletic material to be subsidized or "induced" to enter as students, has been somewhat discredited. The Naval Academy system does not require such methods, as it furnishes a wealth of material from which to select competitors, and its success in athletic competitions is so marked as to justify its adoption by all universities and colleges in this country.

### Some Suggestions

As I have been personally somewhat the victim of past Naval Academy athletic methods, I feel it a duty, on the eve of my retirement from active service after forty-seven years' service, to record here, for the benefit and encouragement of others, some expensive experience which, after all, is the real teacher. Having lost my youth I feel so much consolation in the experience of losing it that I am willing to pass it on hoping that, if what I am going to say should happen to tread on some toes here and there, it will be considered that I am not doing it because my toes have been trodden upon in the past, but only because some other particular toes may seem to be, for the moment, in the way of progress and science.

When I entered the Naval Academy, in 1876, I weighed 107 pounds, grew one and one-half inches the first year, one and one-half inches the second year, and three-fourths of an inch from then on until I got my growth. In youth the period of anatomical or skeleton development does not correspond with actual age, and, in fact, varies with each individual. Manifestly I should never have been allowed, as I did to take part in athletic competitions at that period. When I came up for final graduation, in 1882, the medical board detected a slight mitral murmur of the heart and held me up on my promotion from cadet-midshipman, after six years, to midshipman, there being no vacancy in the grade of Ensign. I went to Philadelphia and got a certificate from the leading heart specialist there, and, on the advice of the Surgeon General of the Navy, the defect was waived and I went to sea as midshipman. It is an amusing thing to look back on, because the physical ex-

aminations now given in the gymnasium at the Naval Academy show that over fifty per cent of the midshipmen develop a mitral murmur as it is only nature adjusting the heart to its work, the heart being a muscular pump. The next time a medical board got me was in 1892. I had been in the Navy sixteen years and was still in the grade of Ensign. On coming up for Lieutenant (junior grade) the medical board examined me, in company with a number of others, and I had passed the physical examination, but it was found that the papers containing my physical records had been misplaced. On finding them, the board became very much agitated at that entry about the mitral murmur of the heart ten years before and re-examined me, but not before I had argued the point considerably. This time the board found me for incomplete convalescence from pneumonia and irregular action of the heart, which irregular action was really due to mental excitement on my part, but they sent me off on six months' sick leave. I regret to state that my pay as an Ensign, on leave, after sixteen years, was $1,000 per annum. I invested some of this large amount in a railway ticket to Battle Creek, Mich., where I saw the famous Dr. J. H. Kellogg, and went into his gymnasium which had the dynamometer, the Swedish system, and a doctor who graphically recorded my pulse before and after all daily exercise. He dated, signed, and *varnished* each tracing. In a few weeks after I entered, I had all the necessary data as to no irregularity in heart beat, but I remained for three months to get into thorough training and to study the system, after which I returned to Washington, submitted my data to the Surgeon General, got a *special* medical examination board and my promotion. That is the way we got the Swedish system and the dynamometer in the Naval Academy gymnasium *sixteen years later*. And now the medical officers of a new generation have introduced scientific methods of watching the heart under physical training; instructions in the treatment of bruises and strains; teaching first aid in athletic injuries; and have revolutionized ideas as to varicose veins, flat feet, mitral murmur, and other physical defects formerly regarded as grounds for the rejection of candidates.

We have dentists in the Navy now and the world is moving, but I may be allowed to express the hope that we will not have to wait for a new generation of medical officers in the Navy to ob-

tain recognition of the fact that there should be on the medical staff of the Naval Academy gymnasium several osteopathic practitioners, or similar mechanical manipulators.

In the beginnings of "posture" and especially in correction of defects of posture, there is much stiffness and some soreness of muscles due to change in balance. In the beginnings of the training in general quite a number of midshipmen develop "acute" flat feet. Previous habits, stiffened ligaments and slight displacements of the bony structure call for slight readjustments of the human mechanism. It is as purely a mechanical process, as tinkering with a machine, and requires that peculiar knowledge which osteopathy gives its practitioners and which is not required of medical officers. It is as much a question of specialization as is dentistry and, moreover, there are specializations in dentistry which overlap the surgeon's work, as was shown in the World War, where the dentists came into their own through so many head wounds, due to trench warfare, whereas, the osteopaths, not being recognized, did not get a chance at shell shock and various other *displacements*, as distinguished from wounds and fractures. However, the issue is plain, in this matter of posture, in the adjustment of slight "mechanical" defects. Exercise, of course, is the real basis of correction in order to *conserve and make permanent* the mechanical adjustments, as it is also a remedy in some forms of varicose veins, flat feet, and a number of former and present causes of the rejection of candidates, the list of which is a most formidable one. When it is realized that the midshipmen are all "hand picked" physically, and, yet, what work is necessary to correct defects, one cannot wonder that fifty per cent of the American youth examined for the draft were sub-normal physically, many with eradicable defects. One out of ten of the young men who applied to the War Department last summer to attend the citizens' military training camps, were rejected as unable to qualify physically.

Each community has its problems and the National Amateur Athletic Federation of America has assumed the task of helping in general. Parenthetically, I would like to say two things: (1) the writer has previously contributed to the NAVAL INSTITUTE PROCEEDINGS two articles, one, "A Plea for Physical Training in the Navy," in 1909, and "The Swedish System," in 1911, which

go into details of the gymnasium methods then advocated; (2) it may be some consolation to realize that it is not because Americans are defective physically as a race that all this is necessary. During the World War, at one of our naval bases in Europe, a foreign visitor of high rank, seeing two dental officers working overtime, remarked that Americans must have awfully bad teeth, but was assured that it was because Americans hated to go around with bad teeth.

What the Naval Academy gymnasium system lacks is here clearly pointed out. Osteopathy is to the framework of the bones and ligaments of the human body what the dynamometer is to the groups of muscles, and does away with any guesswork, as it concerns itself with *mechanical displacements*. My presumption in discussing medical or surgical questions is based on the fact that what is advocated is not either medical or surgical, and my knowledge has been acquired by experience. I am one of the "salvaged" although, after passing subsequent *medical* examining boards on my various promotions, I fell once before the Selection Board on my variegated physical record. For the encouragement of others, it is well to state that it is now considered bad form to pass over officers on their physical records as several mistakes have been made and, furthermore, as an encouragement to others it may be stated that a little bad health in youth makes one wiser, and contributes a better post middle life figure, whereas, an iron constitution is apt to rust from disuse. There is no investment in life one can make better and cheaper than consistent all-round out-of-door exercise as distinguished from athletics.

# SOME FACTS CONNECTED WITH THE PAST AND PRESENT RADIO SITUATION IN THE UNITED STATES

By Rear Admiral W. H. G. Bullard, U. S. Navy, Retired

AT THE outbreak of the World War in 1914, the largest user of radio in the government service, and in fact in the United States, was the Navy Department. At that time the Radio Acts of July 24, 1910 and July 23, 1912, were on the statute books, but the radio activities of the Navy Department were developed as the result of the only previous expressed policy of the Government. This policy was contained in the report of the so-called Roosevelt Board, a board appointed by President Roosevelt in 1904 to study the radio activities of the various departments of the government and to make suitable recommendations regarding their development. The Navy Department was a pioneer in the development of radio in this country, and had interested itself since 1898, the year the first radio installation was brought to this country.

The Roosevelt Board reported that radio was of paramount importance to the Navy Department, and recommended that existing radio installations of certain other government departments be transferred to that Department, and that the Navy should maintain and operate a complete chain of coast signal stations, and should transmit all messages for other government departments. The War Department was to operate shore stations in military areas as part of the national defense and co-operation was to be complete between the two departments of the government organized for war.

The report of the Roosevelt Board, which was approved by the President, is now known to few and seldom referred to, but the Navy Department has always maintained the rights conferred by it and has always assumed the obligations demanded by it.

From time to time, various inter-departmental committees have been appointed by the departments concerned to study special

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questions regarding radio, but none of these have been of the far-reaching importance of the Roosevelt Board, concerning matters of general policy.

As the result of the obligation to construct, maintain and operate a complete chain of coast signal stations, money was yearly appropriated by Congress, and the Navy Department was enabled to keep in communication with the commanders of its fleets and the various units thereof. Shore radio stations of varying degrees of power were built on national territory and territory of overseas possessions, to ensure reliable communication with the ships of the Navy. Naturally all ships of the Navy were fitted with radio installations, not only for communication with the shore stations, but with one another.

Shortly after the introduction of the first radio sets in this country, private companies were formed to exploit this form of communication. These private companies erected shore stations for radio communication with ships at sea and later, when possible, with shore stations in foreign countries, and naturally these corporations were looking for financial gain from their investments.

The rapid development of radio communication early showed the necessity for some form of international agreement, if ships of different nationalities were successfully to communicate with one another, and shore stations of different countries were to communicate with ships of their own and different nationalities. The first international agreement entered into was in 1906, when international delegates met in Berlin and formulated a set of international rules. The United States participated informally in this convention, but this "Berlin Convention" was not submitted to the United States Senate, and in consequence neither the government nor its citizens were bound by its provisions. In 1912 a second international convention was called to meet in London, to bring the Berlin Convention up-to-date; and to this convention the United States sent properly accredited representatives. As the result of deliberations of the international delegates, the London Convention was brought into being, and was later ratified by the United States Senate, proclaimed by the President July 8, 1913, and took on all the effects of law. The requirements of this convention were binding alike upon all government and

private radio interests, though generally the regulations were more for the guidance and observance of private interests, while government interests were allowed great freedom of action.

Many foreign countries had early adopted the policy of government ownership and operation of all radio activities, though the United States had always rejected this policy, without, however, going on definite record except in a negative sense. Several efforts of government representatives to make the so-called "ship to shore" communication a purely government function failed to impress responsible committees of Congress. Also representations were made to make international communication a purely government function, but this also failed to impress Congress. The government representatives based their arguments for government ownership and control on the fact that no interest, whether government or private, could give clear title to the use of the universal ether, but the one best qualified to do it, to prevent interference and to regulate wave lengths, was the government. Practically all those who have given serious thought to this form of communication are agreed that it can best be carried on by one controlling agency, and while the word monopoly is hateful to American ears, it appears that eventually a monopolistic control or regulation must prevail, and Congress must decide whether it will retain this control or regulation in some form of government agency or surrender it to a private company. Most naturally private companies carrying on international radio communication have need of certain definite wave lengths, and their expensive installations must be designed to meet their needs. To be successful, private companies should be protected in their exclusive use of certain bands of wave lengths, but what will be the result if these wave length bands interfere with those of high power stations of the government? To meet all these considerations, what agency is the best so to regulate affairs that both private and government stations may successfully operate without interference? The answer might properly be some form of government commission, which recognizing the equitable needs of all, could so arrange wave lengths, etc., that both government and private business might successfully be carried on. Almost every government except our own has recognized so fully the importance of its international communication, that it has set up some form of agency

to regulate this important link in government affairs. The nearest approach to establishing a governmental agency to regulate communication affairs has been effected by independent departments of the government. Notable among these is the Naval Communication Service, organized under the Navy Department to care for its extensive world wide communication. Not only does this Service provide for the Navy's needs, but for any other department that can make use of it. It would not seem to be difficult to combine all the various communication systems of the different departments into one efficient controlling system, enlarging its scope and giving it regulatory powers over private communication systems, and giving it a government standing for administrative and executive work.

To put into practical effect the London Convention, it was desirable for Congress to enact proper legislation, and this was accomplished by the Radio Act of August 13, 1912. By this act the general regulation of radio activities, other than for the government, was vested in the Department of Commerce. One section of the Act required the extensive chain of government radio stations, under certain conditions, to engage in commercial work by forwarding and receiving radiograms to and from ships at sea.

Private companies organized to conduct general radio business met with indifferent success, and some came into existence only to fade away, but at the beginning of the World War, there remained two principal corporations operating in the United States: namely, The Marconi Company of America and the Federal Telegraph Company of California. The former operated a chain of radio shore stations along our sea coasts and lake regions, some of which had been constructed particularly for that company, while others had been acquired from other wireless companies that had failed. The Marconi Company of America also owned the radio installations of many of the ships flying the American flag, operating them on a rental basis in giving radio service. In addition, this company operated a high power circuit between stations in California and Hawaii and beyond, and had contracted to build a high power station at Marion, Mass., to communicate with a similar station in Norway built by the English Marconi Company, and also was in a position to operate a high power station at New Brunswick, N. J.

The Federal Telegraph Company of California operated a few stations on the Pacific Coast and on ships in the Pacific trade, and in addition, conducted a point-to-point telegraph business along the coast from Portland, Ore., to San Diego, Cal.

The Radio Act of 1912 contained no restrictions as to the construction and operation of shore radio stations on United States territory by foreign interests. As a result, there had been built at Sayville, Long Island, a high-powered station for communication with Nauen in Germany, by a German Wireless Company, and this station was in active operation at the beginning of the war. Similarly, there was being built at that time a high-powered station at Tuckerton, N. J., by another German Company for a French Company, for communication with a similar station at Elvese, in Hanover, Germany.

When World War broke out, it was our obligation as a neutral to see that no unneutral service was performed at either of these two high-powered stations owned and operated by belligerents. By virtue of a proclamation of the President, the Navy Department was charged with the duty of seeing that no unneutral service was performed at these stations, and in consequence strict censorship was established, Navy personnel was placed in charge at both stations and full and complete charge was assumed. As a result of many deliberations, Sayville was finally acquired permanently by the Navy Department, and Tuckerton, after being seized by the Alien Property Custodian, was later turned back to its French owners as determined by a United States Court, and was finally acquired by the Radio Corporation of America, the successor to the Marconi Company of America.

The Marconi Company of America was one link in a chain of radio companies formed in many countries which had their origin in England, and was the result of a far-sighted policy on the part of British subjects who sought to dominate and control this form of international communication in the same manner that British subjects encouraged by the British Government, had previously succeeded in obtaining a virtual monopolistic control of cable communication. American interests had been slow to enter the field of cable communication for international work, and had not always been able apparently to secure entire control when so disposed, being compelled to operate foreign cables under leases, or

to submit to the condition of a foreign majority owned stock, a condition which means that in general the policy is dictated in foreign countries.

At this point it may not be amiss to point out how dependent the United States and its citizens are upon foreign companies, for any submarine cable which may be desired in quantity. It is doubtful if an order for a sufficient length of cable to cross the Pacific Ocean could be filled within two to three years, under most favorable conditions, and a much longer time if it was to the interests of foreign governments to postpone delivery. One can well imagine our condition if we were at war with any of the countries whose factories alone can manufacture efficient submarine cable for telegraphy at this time. It is not difficult for military men to understand the great advantage of having on hand a comparatively short section of cable, and experience in the past has shown how desirable this might have been and has been in time of war, either for laying new cables, or repairing or replacing old ones.

The manufacture of cable is a special art, and requires also special material, which might not always be at hand, as well as special machinery and skilled workmen. Our own cable manufacturers, or at least certain of them, could undoubtedly furnish submarine cable, but possibly not until the need for it was over, for it would mean the construction of a plant, the installation of special machinery and the acquisition of certain skilled men, which under the stress of war might be very difficult.

When the United States entered the war, the whole international communication problem took on an entirely different aspect, and required more drastic action than when we were neutral. The government practically assumed control over all forms of communication which extended beyond its borders, established a complete cable censorship, and virtually assumed a monopolistic control of all radio communication.

As the Navy Department was the one department of the government organized efficiently to carry on international radio communication, that department was charged with all details relating to communication, both by cable and radio.

During the war, it became desirable to exercise complete control over all radio installations of ships flying the American flag,

and place them in charge of Naval personnel. To do this most effectively, it was arranged by the Navy Department to purchase outright these sets from the Marconi Company of America. This company consented to sell these installations to the government, and as their shore radio stations existed only for the purpose of allowing the ships to communicate with the shore, the company insisted on including in the sale of ship apparatus all their existing shore stations. By this sale, the Navy Department came into possession of a great number of shore radio stations, and virtually exercised a war time monopoly of ship to shore communication.

The Federal Telegraph Company of California, operating principally on the Pacific Coast, found itself in financial difficulties during the war, and made overtures to other interests to sell their shore stations for ship work, certain wireless patents, etc. As it became desirable not to have several valuable patents held by that company become the property of any but American interests, notably the patents pertaining to the "arc" transmitter, the Navy Department arranged to purchase all existing patents, and ship to shore radio stations of this company. Thus the Government (Navy Department) came into possession of all shore radio stations for communication with ships at sea, and in addition operated all the high-powered stations on United States soil for overseas work, and during the war, at least, practically dictated the radio policy of the government.

After the cessation of hostilities, and until the war was proclaimed officially ended, the Naval Communication Service of the Navy Department continued to operate all the stations it had acquired during the war, and, to supplement cable communication, operated commercially the radio circuits to England, Norway, France, Germany and Italy on the Atlantic Coast, and to Hawaii, Japan and the Philippines and beyond on the Pacific Coast, using its own and such of the high power stations of the Marconi Company of America as were in operating condition. The Naval Communication Service also operated all ship to shore work.

During the war, the General Electric Company succeeded in perfecting a high power, high frequency alternating current generator, generally referred to as the Alexanderson machine, which was specially effective in transmitting radio signals using continuous waves. This company made arrangements with the Navy

Department to install one of these transmitters in the New Brunswick Station, a Marconi station that had been taken over during the war. This generator proved a great success, for its signals were readily audible in several European receiving stations. The development of this machine seemed to solve the question of successful long distance radio communication, and at that time was undoubtedly the best device developed for that purpose.

It transpired that the head Marconi Company, the one operating in England, had followed the development and tests of the Alexanderson machine with keen interest, and being desirous of installing machines of this make in some of the high-powered stations under its control in different parts of the world, had opened negotiations with the General Electric Company for the purchase of a number of these transmitters. It seemed at that time that this transmitter was the key to the effective development of international radio communication, and whoever controlled the patents for this machine could dominate the radio world for long distance transmission.

In early April, 1919, the writer had just returned from a war detail in Europe, and had assumed the duties of Director of Naval Communications. It might here be remarked also that the writer served from years 1912-16 as superintendent of Naval Radio Service, out of which grew the Naval Communication Service.

The fact that the General Electric Company was negotiating with the English Marconi Company for a sale of a number of the Alexanderson machines was brought to my official notice a few days after my arrival in my office, and immediately sensing the great advantage that would be placed in the hands of foreigners by the successful conclusion of this transaction, I tried at once to prevent it. I had continually in mind the cable situation and its control by foreign interests, and was determined that if possible, this new form of international communication should remain in the hands of American citizens, particularly so, as so many American engineers had provided the most valuable inventions in the radio world.

There was but one natural course to pursue and that was to bring to the attention of the proper officials of the General Electric Company, the vast harm that would be done American interests if their valuable transmitter were sold to foreign com-

panies, thus allowing foreign interests to secure a predominating position for long distance radio work. The only other market for this machine was our own government, or the Marconi Company of America, and there existed sufficient reasons from a patriotic point of view why that company should not possess the right to use this machine.

In early April, 1919, negotiations were under way between officials of the General Electric Company and representatives of the Navy Department regarding the final disposition of the Alexanderson machine in the New Brunswick Station (whether or not the government would purchase the machine), and through these officials a meeting was scheduled between myself, Commander Hooper of the Bureau of Engineering, and certain members of the Board of Directors of the General Electric Company.

This meeting took place on April 6, 1919, in the general office of the company in New York, and there was present at this meeting the president of the company and several vice-presidents. As the senior government representative, I unfolded to these officials the danger to American interests that would ensure if the Alexanderson machine should be sold to any foreign government or foreign private companies, and pointed out that as our citizens had never played any prominent part in cable communication, here was a chance to retain in American hands the key to successful long distance radio communication. Further, I unfolded a scheme of radio communication whereby I hoped to retain in American hands the complete domination of radio communication in the United States, Central and South America, and made reference to a policy of wireless doctrine similar to the greater Monroe Doctrine, by which the control of radio on this continent would remain in American hands. I outlined plans by which an attempt might be made to accomplish this, for my studies of the situation had led me to believe that the American continent, both North and South, would be either the terminus or big relay terminal for all world wide radio communication.

My talk fell on willing ears, and many were the questions asked and answered regarding the performances of the Alexanderson machine, and general world wide communication which my experience as the head of the most important radio service in the United States allowed me to answer to apparent satisfaction. I was told

that the Chairman of the Board of Directors, while then not present, would arrive for luncheon, and on his arrival the story I had to tell was repeated. This gentleman at once evinced the keenest interest, and the contract by which these machines were to be sold to English interests was sent for, and if memory serves correctly, also a check which had been received to close the option. The chairman announced that as the matter had been presented to them, it would be a most unpatriotic action to proceed with the negotiations with the English Company, and as far as the directors then present could do so, they determined to proceed no further for the contemplated sale of the Alexanderson machine. This being accomplished, to my intense satisfaction, the next objective was what to do with the valuable machine which they possessed and which had only been constructed after years of research and laboratory work and the expenditure of large sums of money. For obvious reasons, which will be spoken of later, it could not be sold to the Marconi Company of America; the government was the only other prospective buyer, and its needs were small. The question naturally arose as to where a market could be found, and to this I suggested that the machine could be sold to themselves by forming a really true American Radio Company and thus creating their own market. This thought gave rise to some discussion, and a few days later, information was received that it would be the policy of the General Electric Company to form an American Radio Company, and preliminaries were at once commenced, with the result that the present Radio Corporation of America came into being.

Naturally the formation of an entirely new radio company in the face of the existing Marconi Company of America, already established in the field as a going concern, presented some difficulties, and inquiry was made whether the government would lend its support to the projected new company. As the government had no established general policy, there seemed to be no direct agency to provide this support, but assurance was given that as far as practicable such support would be solicited, with the distinct provision that arrangements should be made by which the Marconi Company should disappear as such. In spite of statements of officials of that company, suspicion had pointed to the fact that that company was dominated entirely by British interests through

its affiliation with the head company in England, and no government support had ever been given this company, nor could it ever hope for such support with this suspicion attached to it. Accordingly the officials of the General Electric Company accepted this view, and the first step in the negotiations resulted in the acquisition of all interests of the Marconi Company of America, and its name disappeared from this country. Thus two important things had been accomplished, the formation of a real American company, and the disappearance of an important subsidiary of the head English Marconi Company, and way was paved for the domination of international radio communication in the United States by loyal citizens of this country. Later the scheme of radio control in South America by United States citizens was accomplished through the energy, ability and far sightedness of the chairman of the Board of Directors of the Radio Corporation of America. The plan finally adopted was not in its entirety that first suggested, but retained all the essential features of American control. Who would not therefore feel proud to have assisted in the successful development of such strong American control of radio activities?

As this paper deals with facts connected with the present radio situation in the United States as well as the past, it would not be complete without a few words in reference to the Federal Telegraph Company of California. Although this company had during the war sold its shore stations, its patents, etc., to the government (Navy Department), it still maintained its organization and its plant for the manufacture of "arc" sets. Mr. R. P. Schwerin had been called to the presidency of this company, and he, with characteristic energy, determined to revive its fallen fortunes and bring it back on the radio map. After the war, Mr. Schwerin set about obtaining a concession from the Chinese Government, by which radio communication would be established with the United States. So diligently did he labor, assisted as he was by our own State Department and our Legation in Peking, that he finally obtained for the Federal Telegraph Company the desired concession to build five shore stations in China, one a super-station for direct communication with the United States, located near Shanghai, and smaller feeder stations at Shanghai, Canton, Peking and Harbin.

Before this concession was formally approved, it became desirable for Mr. Schwerin to show the Chinese government that he had full control of the patents for the arc which it was proposed to use in the China Stations. These patents for the United States were the property of the government (Navy Department) by purchase, and Mr. Schwerin appealed to officials of the present administration to return him these patents. The desirability from an American point of view of having radio stations constructed in China under at least partial American control, appealed to both the responsible heads of the State and Navy Departments, and his appeal was backed up by recommendations of those directly concerned with radio matters in those two departments, with the result that the Federal Company was enabled to obtain rights to their previous patents. The concession by China was then granted, but only after the strongest support of our government and in the face of strong opposition by several foreign governments.

Among the other American radio companies there should be mentioned also the Independent Wireless Telegraph Company, which was organized after the war to conduct in general "ship to shore" radio business. At present this company operates only in the vicinity of New York, but maintains a radio service in several hundred American ships. The Tropical Radio Company, another American Company, operates an extensive radio system, primarily for the interests of the United Fruit Company, its ships and the territory served by its ships. This company operates shore stations in certain countries in Central and South America, and forms a close link in the chain of radio communication.

The present control of radio matters for commercial work in the United States lies entirely in American hands, and with a fine start and bright outlook, we may confidently look to the future for continued and prosperous growth of this active competitor to the cable for international communication. It should not and probably will not ever supplant the cable, but every new means of communication to and from our shores and boundaries means added incentive to business interests. Trade follows communication just as surely, if not more so, than it follows the flag.

# NEW WEAPONS AND OLD ONES

By Captain Gabriel Voitoux, French Navy

As a consequence of all that has been written, up to the present, about the danger henceforth menacing from below and above the sea level, most people put their faith on the pretended unlimited power and possibilities of aircrafts, submarines and mines. Too many enthusiastic dreamers, involuntarily misrepresenting some facts to suit their hazardous theories, have imagined a standard navy of their own fancy and led astray a large part of the public opinion.

So, it appears, not only advisable, but *indispensable* simply to recall facts, whether for or against the so-called "New Weapons." The man in the street must be given the means to get an understanding of what is in the power of those new weapons, and what remains out of their reach, before "scrapping the old ones," as Lord Fisher, the father of the battle cruiser, wanted to do in advising to "Scrap the lot."

I. Before Admiral Keyes accomplished his glorious deed, the Allies [more particularly French—Belgians—British] were anxious to destroy the Zeebrugge floodgate, so as to hamper that submarine base. Our flying machines endeavored, for nearly four years to accomplish this task without much, if any, success. Now, Zeebrugge is but a *few miles* distant from our shores, as well as from the old "front" whilst Panama lies *thousands of miles* from European or Asiatic shores.

II. The Germans were not less anxious to wreck the sole floodgate that closes the "de Frecynet" dock at Dunkirk the destruction of which would have rendered useless that port. But, although their airplanes made innumerable efforts, that floodgate was never hit.

III. The *Goëben,* in a sinking state, had to be stranded at Nagara [Dardanelles] and was stuck there a whole week for repairs. The Allies anticipated its destruction, the ship appearing to be at their mercy. Every one expected to hear, at any moment, that

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the famous ship had been rendered useless. It was many times flown over, some say 275 times with nearly a thousand missiles dropped and sixteen hits recorded. Anyhow, the *Goëben* sailed for Constantinople the seventh day. Less than a month later, this lucky battle cruiser was, in a fighting condition, cruising in the Black Sea. Here, we must recollect that, at Nagara, the *Goëben* was in a fixed position with likely no other means of defense than its own anti-aircraft guns.

IV. Briey, the minefield whence the Germans got their iron ore, was never seriously hampered by our flying machines.

V. Paris was submitted to numerous aerial visits, but not a single hit ever struck a vital place. So the attacks were made with little military effect, although, one must acknowledge that some women, and a very few men, were nervous and left. No doubt the German attempts over London did not have any better effect than against Paris.

VI. The havoc prophesied done by torpedo planes wants yet to be qualified by war practice. In the course of the late hostilities this weapon was not in great favor. The only recorded success is a merchant vessel sunk some place in the North Sea. In fact torpedo planes were few, and seldom used, in the last war although, thanks to Admiral Bradley Fiske, this weapon was amply known in 1914.

VII. Have we so soon forgotten that, despite submarines, two millions of Americans crossed the Atlantic with the loss of less than 300 souls?

VIII. Can we ignore that from the beginning of the war to the last period the booty of submarines decreased in proportion from ten to one, thanks to the defensive and offensive means created during the four years' struggle? Means among which, alas adopted in 1917 only, was the *convoy system* with its perfect London organization. Admiral Sims, who greatly favored the system, has described it since in the *World's Work*.

IX. We read that *"One hundred thousand tons of battleships were sent by submarines to the bottom of the Ocean."*

True, big ships were sunk by submarines at the beginning of the war; but their loss was mostly due to a blameworthy and imprudent policy. For instance, the promenading of three *aboukirs* across the Bight of Helgoland without any protec-

tion, was a silly adventure. The Captains' trying, successively, to save each other's crews was a great fault. Humanity, as well as the military point of view, commanded *to get out of the way.* The commander of the victorious *U*-boat would have been quite contented with his first success; he was most astonished to get a second, then a third, opportunity. But he did not live long to enjoy his fame: In command of another *U*-boat, endeavoring to sink one of the battleships which periodically cruised in the North Sea, this commander was sent to the bottom with his craft.

It must be remembered that if new weapons, under and above the sea level, compelled the adoption of special means to protect the surface fleets from being *ambushed,* it nevertheless was the latter that gave the Allies the command of the seas, and compelled the Germans, after the surprise opportunity of a battle at Jutland, to keep their forces hidden until the day came when they had to surrender them. Submarines and aircrafts were of no practical value at Jutland. Guns alone settled the doom of ships like the *Lutzow,* the *Queen-Mary* and the *Invincible.* If torpedoes did some havoc among lesser ships, they were fired by destroyers.

The autumn 1918 issues of the *London Magazine* contain several articles in which the Naval Secretary, basing his opinion on the results of the naval war, says that the gun, in naval warfare, *keeps unquestionably the lead.* And we know that the big gun means the capital ship. He says besides that the strongest navy has the whole command of the seas, nothing being left to a lesser fleet: *Everything to the strongest, nothing to the next one.*

X. We read another critic in the papers. "Battleships employed in bombarding the Dardanelles all [except those that were sent to the bottom] ran away into Mudros harbor on sight of a submarine." Capital ships were never meant to conquer, by themselves, the armed shores of any country, except in rare circumstances which did not occur, at any time, throughout the late war, unless, perhaps, at the very beginning of hostilities, against the shores of Helgoland Bight. If so, the chance was missed.

The attempt at forcing the Dardanelles was no business of the fleet unaided by land forces. This operation, it is said, was decided on without the Admiralty's agreement, more exactly without the advice of members of the Admiralty having been required. The shore can bear any number of guns, no matter what their size. It

can withstand any number of hits, the armaments being considerably better protected than on board ship. The command, and the fire control, being more safely situated, consequently the fire is more accurate. The stability is absolute, with no risk of sinking.

Ships, on the contrary, carry a limited number of guns and amount of ammunition, and they are liable to be sunk. While a shore battery, often out of sight, runs the sole risk of gun shots, a ship is menaced by bombs, mines and submarine torpedoes, as well as by the gun fire of the shore battery.

Obviously the task pertaining to capital ships is on the open seas where their duty is to take the command over the enemy, indispensable to the keeping open of their lines of supply. This object was fully attained in the war: apart from the Dogger Bank and the Jutland affairs, the German fleet was closely confined and could be of no help to her *submarine guerre de course.* But, for sometime, isolated cruisers at large, and chiefly the squadron of Admiral Von Spee, were a very serious menace to our re-victualling, which was already hampered in Europe by submarines. Against the latter, at the beginning of the war, and for nearly three years thereafter, the Allies were almost unarmed.

It was vital to get rid of all the German cruisers at large. This task was not that of submarines nor of aircraft. Only surface ships, cruisers and battleships, could perform it. The two battle cruisers that, mainly, settled the question of Admiral Von Spee's squadron, accomplished a task that no other weapon, at such a distance, and in such a place, could have performed.[1]

This was a task for capital ships. But not the attack of the Dardanelles as it was undertaken. Nor would have been justified the attack of any shore strongly protected and armed like that of the Bight of Helgoland after the first months of war or, now, the Zeebrugge coastline. Nor, had it been attempted as it was once projected, the passing through the straits which give access into the Baltic. This scheme was to be accomplished with the purposely built, fast and strongly armed, big light cruiser of

[1] Supposing that the three battle cruisers of Admiral Milne had succeeded in catching the *Goëben,* the sinking of that ship would have been an immense success by which the war might have been greatly shortened and the ruin of Europe spared. Submarines in plenty were in the Mediterranean, French as well as British. Did they stop the *Goëben* with no other protection than its speed?

small draught of the *Furious* type now an aircraft carrier. Happily for the Allies this dangerous operation was never attempted.

Some general observations find their place here:

It is most astonishing how people who so earnestly endeavor to convince their countrymen of their personal faith about some newly appeared weapons, most always forget to take account that any would-be enemy could provide himself with the same, and that he would besides, inevitably, search for, find and create the counterpoise. Sometimes those dreamers make a total abstraction of the enemy; they carry out their policy just as if the opponent were in a state of lethargy.

Another puzzle is how so many people, even some sailors, are ignorant of the sea's immensity and consider the naval war problems just as if they had to deal with the Lake of Geneva. For them there is no relation between the distance of the enemy and the radius of their pet weapon; and as they do not consider the enemy's counteraction, their missiles are bound to hit the mark just as easily as they would in an experiment to prove their efficiency. Firing tests, circumstances of war, is all one to them. To them the probability of hitting the mark is the same in both cases. For the dreamer the complacent enemy always places himself within his reach and then goes asleep.

Still another puzzle. How long it takes certain people to realize that an airplane cannot, in any respect, be compared to a battleship, and, although henceforth an indispensable adjunct to the latter, cannot supersede it. Their foolish state of mind carries them to estimate, with obviously fallacious factors, how many airplanes could be purchased with the cost of a battleship. They would readily put all the money in airplanes without thinking [neglecting here all other considerations] of the factor of longevity which is ephemeral for the airplane as compared to the methuselah-like life of a ship.

Would Foch—Pershing—Douglas Haig—have won the War with airplanes? Would airplanes have safely protected against submarines Pershing's armies across the Atlantic? Would the Germans have signed the Armistice under the mere threat of airplanes? In fact the last word belonged to surface ships on sea and to men on land. So thought the German Admiralty and

Marshal Hindenburg. It was ever thus and, probably ever will be.

One more extract from the press, which brings up the following discussion: *The Australians appear to be in doubt as to whether they can defend their shores with the new weapons against attack by Japanese battleships.*

If the Australians are quite content with their enormous island of some six thousand miles circuit, and can live on its own resources, they have apparently no need of battleships to secure the inviolability of their shores. New weapons, as the dreamers call them, although most antedate to 1914, will do. They can assure their independence with a proper light surface fleet, submarines and aircraft. *But,* admitting for instance, the hypothesis of a war breaking out between Australia and Japan. The former's communications across the sea would be cut short, even those with Great Britain, because at the present moment, the well-balanced Japanese fleet [comprising the different crafts that constitute nowadays an efficient fleet] command beyond doubt the oriental seas. British and American[1] fleets are, each, stronger than Japan's; but one must never forget that a ship worth *one* in its own waters, may value *one-tenth,* or come to *nought,* at thousands of miles from a proper base.

From such a point of view Great Britain is right in her endeavor to complete a very strong naval base at Singapore. At least if she intends to restrain ambitions that her rich dominions may provoke some day in the Far East.

Had the United States a desire of getting the mastery of the Oriental Seas, they would be compelled to curb it on account of the immense stretch of water across the Pacific which separates that country from the Philippines; Honolulu and Guam, in their present state, being quite insufficient bases for a force such as the American Navy.

Aircraft from Europe and Asia, as a menace against the U. S. A., are mere scarecrows. Aircraft, those wandering Jews, compelled to travel fast and make non-stop circuits, carrying tremendous missiles but in limited quantity, having to face adverse machines, obliged to act relatively close to a shore or floating base,

[1] To be a well balanced fleet the American Navy wants battle cruisers and more light cruisers.

have indeed a very small chance to hit the mark on the American continent. One may easily imagine to what an infinitesimal figure that chance amounts to when told that this wandering Jew has to come from Europe or Asia, of course shipped on aircraft carriers, to assail any part of the United States coasts, and meet there the formidable means, both defensive and offensive, that that country is able to put in action: airplanes, seaplanes, submarines and the whole surface fleet. Thus the chance of the carriers to reach safely the appointed spot chosen as a base, multiplied by the chance that the carrier's weapons have to travel from there to the mark and hit it, come very nearly to nought. The game would not be worth the candle.

As for an eventual attack from a foreign base purposely chosen as close as possible to the Panama Canal, its realization seems little probable now, or at any time in the near future. Morally as well as materially, the Monroe Doctrine is stronger than ever and the U. S. A. amply able to enforce it. The surest means to check a covetous ambition is strength; and strength, in every respect, is the happy lot of Americans.

Now, this brings a Frenchman to consider the tremendous task that France's immense colonial empire, scattered all over the world, puts on the French scarce and threadbare navy left to us after the war. This situation, which was ignored voluntarily or otherwise by most experts, is the puzzle of the man in the street who cannot imagine that a country smaller than some single American states, should be in need of a strong navy. He, therefore, calls us *imperialists*.

What can destroy this injustice?

Obviously we will have to wait until time brings the truth to light and justifies our claims and our policy of self-conservation, which we have based on right and equity. But meanwhile, daily menaced by the Germans, we must not relax an instant our watch on our Eastern frontier.

# THE ANSWER IS 135,000 MEN

## "A JUST MAN ARMED KEEPETH HIS HOUSE IN ORDER"

By Captain J. K. Taussig, U. S. Navy

### Foreword

THE title of this paper is the answer to this question: What is the numerical strength of the enlisted personnel necessary to maintain our Navy on a 5-5-3 ratio with the navies of Great Britian and Japan?

This problem is one of arithmetic, and has been solved at different times and in different ways. As the premises used have widely differed it is not surprising that the answers have varied from 67,000 men to 135,000 men.

The object of this paper is to make a brief analysis of the enlisted personnel requirements with a view to obtaining the *right* answer.

The "Study of Our Navy Personnel Situation" made two years ago and published in the Naval Institute Proceedings of August, 1921, was based on the Navy as then constituted. This was before the Limitation of Armament Treaty had been made. Under the then existing conditions it was shown by argument and statistics that our peace time enlisted strength should be 170,785 men.

The factors used in determining this figure were:

1. The types and numbers of fighting ships that were to be maintained in full commission, in reserve, and otherwise.
2. The complements of these ships.
3. The number of auxiliaries necessary for the maintenance and operation of these fighting ships, and the complements of these auxiliaries.
4. The types and numbers of ships under construction.
5. The shore stations and shore activities for which officers and men were required.

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6. The number of men to be kept under training at all times.

7. The number of men on general detail, on re-enlistment leave, and in hospitals.

8. The numerical strength of our trained reserve force.

There then being no Departmental policy as to the types and numbers of fighting ships that were to be maintained in full commission, in reserve, and otherwise, it was necessary for the writer, in order to form a basis for calculating the number of men required, to formulate his own policy in accordance with ideas which appeared to be correct. This policy was founded on the principle that—"No matter what the strategical and international situation may be, our active fleet must be no smaller than is required for the proper training of the personnel."

With this as a basis the following table was made showing the proposed status of the fighting ships then on the Navy List:

TABLE I

| Type | Class | Total No. | Full Commission | In Reserve | In Ordinary |
|---|---|---|---|---|---|
| Battleship | Battleship, 1st Line | 27 | 20 | 7 | 0 |
| | Battleship, 2nd Line | 22 | 0 | 13 | 9 |
| | Monitor, 2nd Line | 6 | 0 | 4 | 2 |
| Cruiser | Battle Cruiser | 6 | 6 | 0 | 0 |
| | Cruiser, 2nd Line | 16 | 8 | 8 | 0 |
| | Light Cruiser, 1st Line | 10 | 10 | 0 | 0 |
| | Light Cruiser, 2nd Line | 3 | 0 | 3 | 0 |
| | Aircraft Carrier | 1 | 1 | 0 | 0 |
| | Mine Layer | 4 | 2 | 2 | 0 |
| Destroyer | Destroyer, 1st Line | 304 | 190 | 114 | 0 |
| | Destroyer, 2nd Line | 21 | 0 | 0 | 21 |
| Submarine | Submarine, 1st Line | 94 | 94 | 0 | 0 |
| | Submarine, 2nd Line | 48 | 34 | 6 | 8 |
| | Fleet Submarine | 12 | 12 | 0 | 0 |
| Patrol | Eagle | 55 | 5 | 50 | 0 |
| | Gunboat | 30 | 19 | 0 | 11 |
| | Yacht | 10 | 5 | 5 | 0 |
| | Submarine Chaser | 60 | 30 | 30 | 0 |

In making up this table the number of ships to be kept in commission was based on the proper number to give a balanced fleet, using 20 battleships as the nucleus, and to have sufficient additional ships for performing duty on the Asiatic Station,

European Station, and with the Special Service Squadron, Naval Reserve, etc.

In determining the personnel requirements, it was held that all ships of the active fleet should have full complements; that ships in reserve should have fifty per cent complements, and that ships in ordinary should have sufficient personnel to keep them materially fit. It was assumed that no ships are carried on the Navy List in time of peace that are not to be used in time of war. It is believed that all of the above premises are still correct, and must be so taken if the right answer is to be obtained for the conditions which now exist.

All the other factors which enter into the determination of our enlisted personnel strength depend to a more or less extent on the size of the active fleet. The personnel requirements to meet the needs of these factors were obtained by an estimate of the situation, the results of which, insofar as enlisted men are concerned, are here tabulated.

TABLE II

ENLISTED MEN REQUIREMENTS AT SEA PRIOR TO LIMITATION OF ARMAMENT TREATY

| | | |
|---|---|---|
| Active fighting ships (Full complements) | 78,830 | |
| Active Auxiliaries (Full complements) | 15,430 | |
| Aviation duty at sea | 1,210 | |
| Staff duty at sea | 795 | |
| Total Sea Requirements | | 96,265 |
| Ships in Reserve (Half complements) | 25,525 | |
| Staff | 215 | |
| Ships in Ordinary | 2,230 | |
| Total | | 27,970 |
| GRAND TOTAL—REQUIREMENTS AFLOAT | | 124,235 |

TABLE III

ENLISTED MEN REQUIREMENTS ON SHORE PRIOR TO LIMITATION OF ARMAMENT TREATY

| | | |
|---|---|---|
| Bureau of Navigation (Recruiting, etc.) | 6,800 | |
| Bureau of Ordnance (Torpedo Station, etc.) | 2,100 | |
| Naval Districts, Yards, and Stations | 4,950 | |
| Air Stations | 4,000 | |
| Radio Stations | 2,200 | |
| | | 20,050 |

| | |
|---|---|
| Under Training | 15,000 |
| Sick, etc. | 4,300 |
| Replacements | 7,200 |
| | 26,50 |
| Total Shore Requirements | 46,50 |
| Total Sea Requirements | 124,28 |
| GRAND TOTAL | 170,78 |

THE EFFECT OF THE LIMITATION OF ARMAMENT TREATY

When the foregoing figures were estimated, the Limitation of Armament Convention had not assembled. Prior to beginning the estimate the writer stated:

"It is hoped that the study which follows will not be taken as a plea for a large Navy, or an argument against the reduction of armaments. Nothing of this sort is intended. Nor is it the intention to estimate the numbers and types of ships this country should have in the Navy. The object is to show the necessity for an active naval personnel sufficient as to numbers and suitably educated and trained in order to be able efficiently to employ such material as we now possess, and to ensure our being ready in case of an emergency."

On the completion of the estimate this statement was made:

"These numbers are simply a matter of arithmetic. Should there be partial disarmament, there should of course, be a corresponding reduction in personnel. On the other hand should Congress make provision for new ships there must be a corresponding augmentation in the numbers of officers and men."

After the Limitation of Armament Treaty became effective all the figures of the estimate as given in the summary of Table I were corrected to conform to the requirements of the provisions of the Treaty. The new tables showed that the reduction in the number of ships made necessary by the Treaty, reduced the total number of men required in time of peace from 170,785 to 135,036. The distribution of this 135,036 men is tabulated as follows:

TABLE IV

| *Class of Ships* | *Number* | *Number of Men* |
|---|---|---|
| Fighting Ships—(Full Commission) | | |
| Battleships | 18 | 22,500 |
| Aircraft Carriers | 1 | 339 |
| Cruisers | 21 | 12,642 |
| Destroyers | 133 | 15,162 |
| Submarines | 136 | 4,352 |
| Mine Layers | 4 | 1,428 |
| Gunboats | 12 | 1,248 |
| Eagle Boats | 5 | 270 |
| Yachts | 5 | 480 |
| Submarine Chasers | 30 | 720 |
| Aviation Personnel at Sea | ... | 1,130 |
| Flag Officer Complements | ... | 795 |
| Total Fighting Ships (Full Commission) | 365 | 61,066 |
| Auxiliaries (Full Commission) | | |
| Aircraft Tenders | 1 | 286 |
| Destroyer Tenders | 9 | 3,348 |
| Submarine Tenders | 9 | 2,385 |
| Repair Ships | 3 | 1,168 |
| Store Ships | 6 | 984 |
| Colliers | 12 | 1,464 |
| Oilers | 14 | 1,330 |
| Ammunition Ships | 2 | 354 |
| Cargo Ships | 5 | 460 |
| Transports | 3 | 915 |
| Fleet Tugs | 20 | 760 |
| Mine Sweepers | 20 | 1,080 |
| Total Auxiliaries (Full Commission) | 107 | 15,500 |
| Total—All Ships—Full Commission | 472 | 76,566 |
| Fighting Ships and Auxiliaries in Reserve | 399 | 18,970 |
| GRAND TOTAL—AFLOAT | 871 | 95,536 |
| On Shore Duty— | | |
| Bureau of Navigation | | 5,500 |
| Bureau of Ordnance | | 2,100 |
| Naval Districts, Navy Yards, etc. | | 12,500 |
| Special Training | | 2,500 |
| Recruits in Training | | 11,500 |
| Replacements | | 5,750 |
| Total on Shore Duty | | 39,500 |
| GRAND TOTAL—AFLOAT AND ASHORE | | 135,036 |

It should be borne in mind that the above figures are the result of an estimate of the situation based on a policy formulated by the writer, and not by the Department. It might be expected, under the circumstances, that those responsible for recommending and providing the necessary personnel would not be guided by these figures.

### The Effect of the United States Naval Policy on Numerical Strength

Shortly after the Limitation of Armament Treaty became effective the General Board of the Navy evolved an "United States Naval Policy" which was approved by the Secretary of the Navy. This policy clearly enunciates certain principles which form a definite basis on which to estimate the personnel needs of the Navy. It accordingly seemed that if calculations were made, using the statements of this approved departmental policy as precepts, the figures arrived at would be the correct answer to the question as to what should be the numerical strength of the enlisted personnel. It would then seem these figures might be taken as a guide for recommendations as to future personnel needs. Therefore, the decision was reached to make a calculation of the enlisted personnel needs based on this policy and to ascertain wherein the result differed from that obtained by the writer, based on his own idea of what the policy should be.

The first statement under the heading of "General Naval Policy" is:

"To create, maintain and operate a Navy second to none, and in conformity with the ratios for capital ships established by the Treaty for Limitation of Naval Armaments."

In this paper we are not concerned with the *creation* of this Navy, but we are concerned with the maintenance and operation of so much of it as we now actually have on the Navy List, including the ships under construction. So this statement of policy is of importance in connection with the estimate of personnel needs.

Under the heading of "Operating Policy" are these statements:

"To keep all capital ships fully manned and in active training.

"To keep all aircraft carriers fully manned and in active training.

"To keep all modern cruisers fully manned and actively cruising.
"To keep 152 destroyers fully manned and in active training.
"To keep all submarines fully manned and in active training.
"To keep all other modern fighting vessels partially manned and in commission.
"To put vessels assigned to reserve in condition for active service and so to maintain them.
"To operate a Naval Train sufficient for the upkeep and mobility of the fighting ships and expeditionary forces it serves, and designed to be a nucleus of a transport and train service in case of war.
"To assign suitable, partially manned vessels for the training of Naval Reserves."

It is evident, of course, that practically none of these Operating Policies are being carried out. The reason for this is the shortage in the numerical strength of the enlisted personnel. While the permanent authorized strength is 137,485 men, this number is reduced, during the present fiscal year, to 86,000 by the simple expedient of Congress appropriating only sufficient funds to pay that number of men. In other words, the Department cannot carry out its approved Operating Policy because this policy primarily depends for its accomplishment on the fulfillment of the Personnel Policy, which states among other things:

"To maintain a personnel sufficient to carry out the Operating Policy" and
"To maintain an active personnel afloat in conformity with the ratios for capital ships established by the Treaty for the Limitation of Naval Armaments."

The weakness in the Naval Policy, therefore, is in the fact that it is only a *Naval* policy and not a *National* policy. To make it a National Policy and, therefore, one that would carry weight with Congress, it is necessary to have the President's approval.

As the Congress does not see fit to authorize sufficient men to carry out the Department's Personnel Policy, the Operating Policy of necessity, goes by default. The Department therefore is placed in the position where in formulating an Operating Plan, this plan cannot be based on the approved Naval Policy, but is dependent entirely on the number of enlisted men allowed. That

is, the number of ships in commission depends entirely on the number of men in the Navy, instead of having the number of men depend on the number of ships that the Policy calls for to be kept in commission.

This is shown by the published "Proposed Operating Plan and Replacement Plan for July 1, 1924, to June 30, 1925," in which the number of vessels to be kept in commission and the allowance of personnel for these ships and the shore establishments are based on a total of 91,966 men which the Department *hopes* will be authorized in the next Congress.

The following table shows a comparison of the fighting vessels of the Active Fleet as it will be if the Operating Plan is carried out, and as it should be if the requirements of the Naval Policy were adhered to:

TABLE V

| Fighting Ships by Classes | Operating Plan | | Naval Policy | | |
|---|---|---|---|---|---|
| | No. | Personnel Allowance | No. | Personnel Requirements | Personnel Difference |
| Battleships, 1st Line | 18 | 21,332 | 18 | 24,300 | 2,968 |
| Cruisers, 2nd Line | 5 | 2,632 | 11 | 6,875 | 4,243 |
| Light Cruisers, 1st Line | 10 | 4,190 | 10 | 4,190 | ..... |
| Light Cruisers, 2nd Line | 4 | 1,164 | 12 | 4,200 | 3,036 |
| Aircraft Carrier, 1st Line | 1 | 1,121 | 2 | 2,242 | 1,121 |
| Aircraft Carrier, 2nd Line | 1 | 342 | 1 | 342 | ..... |
| Mine Layers, 2nd Line | 2 | 712 | 2 | 712 | ..... |
| Destroyers, 1st Line | 107 | 10,914 | 152 | 17,480 | 6,566 |
| Light Mine Layers | 6 | 594 | 6 | 690 | 96 |
| Submarines, 1st Line | 84 | 2,618 | 98 | 3,136 | 518 |
| Submarines, 2nd Line | 0 | ..... | 27 | 675 | 675 |
| Fleet Submarines | 3 | 183 | 6 | 366 | 183 |
| Patrol Vessels—Gunboats | 10 | 933 | 10 | 933 | ..... |
| Patrol Vessels—Yachts | 5 | 472 | 5 | 472 | ..... |
| Total | 256 | 47,207 | 360 | 66,613 | 19,406 |

We see from this that the portion of the Operating Plan which relates to the active fighting ships to be retained in full commission, and which is based on a total enlisted personnel of 86,000 men and 6,000 apprentices, contains 104 fewer vessels and 19,406 less men than are required by the approved Naval Policy which is based on the maintenance and operation of a Navy second to none, and in conformity with the ratios for capital ships established by the Treaty for Limitation of Naval Armaments. In other words, our shortage of personnel prevents us from placing in

full commission 104 fighting vessels necessary for the proper balancing of our *active* fleet and to insure the adequate training of the personnel which will keep our fleet on an equality with that of Great Britian and superior to that of Japan in the ratio of 5 to 3.

But, in addition to these 104 fighting ships which are not to be commissioned, there are many other fighting ships which require personnel in order to comply with that part of the Naval Policy which states:

"To keep all other modern fighting vessels partially manned and in commission."

Let us see what these *other* fighting ships are, and in order to keep them in commission and materially fit, what numbers of men should be placed on board them.

TABLE VI

Other Fighting Ships which should be maintained in commission in Reserve (one-half complement) and for which no personnel is provided for in the Operating Plan

| Class | Number | Personnel Requirements (½ Complements) |
|---|---|---|
| Mine Layers, 2nd Line | 2 | 356 |
| Destroyers, 1st Line | 129 | 7,418 |
| Destroyers, 2nd Line | 21 | 1,050 |
| Light Mine Layers | 8 | 456 |
| Total | 160 | 9,280 |

From Tables V and VI we see that in order to carry out that part of the approved Naval Policy which gives the number of fighting ships to be maintained in service with full complements and with partial complements, there are required for the full commissioned ships 66,613 men and for the reserve ships 9,280 men, making a total of 75,893 men. The Operating Plan based on a total enlisted strength of 91,966 men allows only 47,207 men for manning the fighting vessels of the fleet. We thus see that here alone the enlisted strength of the Navy is 28,812 men short of requirements.

But the requirements of manning the fighting vessels is only one of the factors which enter into the total personnel strength. We must still consider the additional personnel necessary, as expressed in the policy:

(a) "To operate a Naval Train sufficient for the upkeep and mobility of the fighting ships, etc.

(b) "To assign suitable, partially manned vessels for the training of Naval Reserves.

(c) "To maintain in operation the number of shore stations required to support the Navy in time of peace.

(d) "To maintain a personnel sufficient to carry out the Operating Policy." This includes the men for training, aviation, communications, recruiting, and replacements.

It is not the intention to go into a long analysis of the personnel needed to fulfill the requirements of the four foregoing statements of policy. That personnel is required and the reasons therefore must be clearly understood by all. The reasoning by which the numbers shown in Table I of this paper were obtained was fully set forth in the study previously referred to. However, in order to determine the personnel needs in addition to the fighting ship requirements, the Department's Operating Plan will be used as a basis. It will be assumed that with the Naval Policy conditions fulfilled the number of men required for auxiliaries will be but little in excess of those provided for in the Operating Plan. The number of men allowed by the Operating Plan for this purpose is 12,910.

We can now make a comparison as to the total number of men afloat in accordance with the Department's Operating Plan which is based on a total enlisted personnel of 91,966 men, and of the number that should be afloat if the Department's promulgated Naval Policy were carried out.

TABLE VII

| Class | Operating Plan | | Naval Policy | |
|---|---|---|---|---|
| | No. of Ships | Enlisted Men Allowed | No. of Ships | Enlisted Men Required |
| Fighting Ships— | | | | |
| Active Commission | 256 | 47,207 | 360 | 66,613 |
| Reserve Commission | 0 | ..... | 158 | 9,280 |
| Out of Commission | 262 | ..... | 0 | ..... |
| Auxiliaries— | | | | |
| Active Commission | 83 | 12,910 | 90 | 12,910 |
| Reserve Commission | 0 | ..... | 38 | 900 |
| Out of Commission | 45 | ..... | 0 | ..... |
| Flag Complements | ..... | 1,111 | ..... | 1,111 |
| Fleet Aviation | ..... | 1,463 | ..... | 1,463 |
| Total | 646 | 62,691 | 646 | 92,277 |
| 2½% Replacements | ..... | 1,567 | ..... | 2,307 |
| Total Forces Afloat | ..... | 64,258 | ..... | 94,584 |

### Requirements for the Shore Establishments

In the Operating Plan based on a total enlisted strength of 91,966 men we find that after arriving at the total Forces Afloat of 64,258 men, there is given a summary for the shore establishment as follows:

"District Vessels including shore based submarine tenders, Receiving Ships and Barracks, Yards and Stations, Training Stations and Trade Schools, Hospitals, Prisons, Communications, Aviation, Ammunition Depots and Torpedo Stations, Recruiting, Miscellaneous, Under Training in Trade Schools and Training Stations, Sick, Prisoners, General Detail, in transit—27,708," which number added to the Forces Afloat—64,258, makes up the total of 91,966, which figure was used as the basis on which the Operating Plan distribution was made.

In this distribution the 64,258 men allocated afloat is 70% of the total. It has been found by experience that this percentage is the *maximum* that can be kept afloat. We can therefore correctly assume that in estimating for the necessary men to maintain the shore establishment under the Navy Policy requirements, that the number 94,584 which has been found necessary for the forces afloat is only seventy per cent of the total requirements. Therefore, the total requirements are 135,120 enlisted men. Q. E. D.

It is of interest to note that this number which is based on the premises given in the Department's Naval Policy, differs only by 84 men from that previously obtained by using the writer's own policy as a premise.

### Conclusion

A comparison of our personnel status prior to the Great War with that at present shows that relatively we are worse off now than we were then. In 1916 when the enlisted personnel strength authorized by law was 52,000 men, the General Board reported to the Secretary of the Navy that the total peace time strength should be 71,500 men. In other words we were then attempting to maintain our Navy with only seventy-three per cent of the personnel necessary. We all know how embarrassing this situation was when war was declared. Today, in accordance with the Naval Policy, we require 135,000 men, but are attempting to get

along with 86,000 which is only sixty-four per cent of that number.

When we consider that should another war come the Navy will require 500,000 men almost immediately, and that among the first vessels wanted will be the destroyers, of which 107 are operating with short crews and the other 193 are out of commission with no crews, is it hard to imagine what the conditions will be should there be a sudden call for mobilization? Is it pleasant to contemplate the operating conditions on these destroyers when thrown into service with green untrained crews? Can we get trained men for them except by taking them from the battleships? Do we want to have to do this? Are we going to have Allies stand between us and our enemy while we prepare? The answer to all these questions is "NO."

We had therefore better put our house in order, and the first step necessary is to obtain sufficient personnel to care for it.

THE NUMBER REQUIRED IS 135,000 MEN.

# A DIRECT READING COURSE AND SPEED INDICATOR

By Commander Russell Willson, U. S. Navy

In the Naval Institute of August, 1922, there were described, under the title "Aids to Accuracy in Battleship Maneuvers" two "Course Angle Cards" designed particularly for solving more conveniently the problems of "what course and for how long" that occur frequently in the maneuvers of the battle line.

These two course angle cards—one for full speed, the other for standard speed evolutions—were used by several battleships during the recent fleet exercises. The favorable comment as to their value in maneuvers of the battle line has suggested the construction of a third course angle card designed primarily for the use of units not in the battle line but nevertheless stationed upon, and maneuvering relative to the fleet guide, such a unit, for example, as a section of destroyers, 10,000 yards ahead of the fleet guide, when the fleet executes a change of front of 30°.

For such units not in the battle line, the problems of course and speed are different from those of the battle line maneuvers, for which the Full Speed and Standard Speed Cards were constructed. In the evolutions of these outlying units there is a wide range of available speeds compared with the speed of the guide, no necessity for considering turning circles and no limit of 90° for course angles. The card which has been constructed for their use and which is described in this article is called an "Any Speed Course Angle Card."

Of course a maneuvering board (H. O. 2665) in practiced hands will give the various practicable changes of course and speed required for any change of formation or position. But on destroyers there are few maneuvering board experts, and this fact is not surprising for—as most officers will agree—the triangles of the mooring board are one of the most elusive bits of naval knowledge. Any superiority of this "Card" over the ordinary

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methods of using the maneuvering board must lie in its being simpler in operation, and hence more readily learned and remembered.

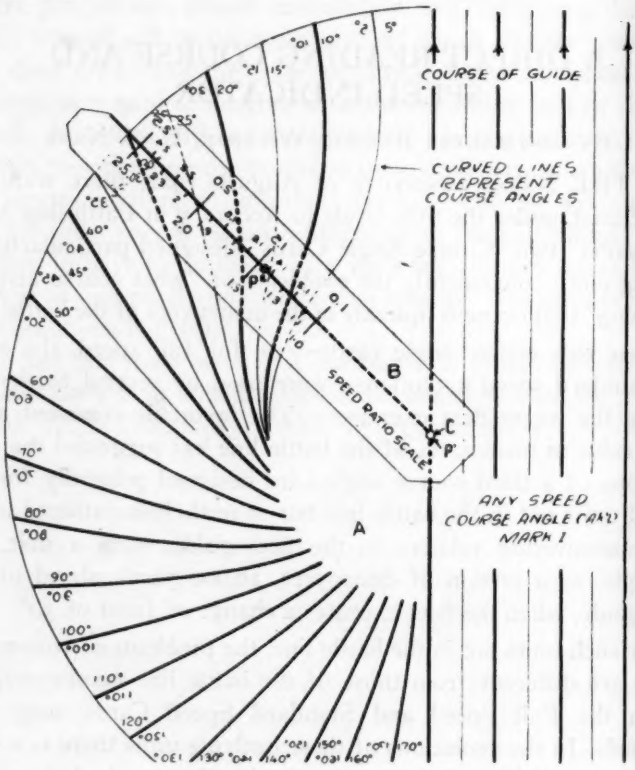


FIG. I

## DESCRIPTION

The "Any Speed Course Angle Card" is designed for use with the ordinary mooring and maneuvering board in more readily determining the various combinations of course and speed (not less than the guide's speed) by which a unit in one position, relative to a guide of known course and speed, may proceed directly to another position relative to that guide.

The card is illustrated in figure 1. It consists of a transparent celluloid card "A," near the center of which is pivoted a movable arm B, also of transparent celluloid. On both A and B are printed certain lines and figures, the whole being arranged so

that the card may be turned over and used with equal facility on either side.

At the right of the card (as shown in diagram) are parallel lines for use in orienting the card on the mooring board. The left part of the card (as shown in diagram) bears a series of radial curves, marked at the outer ends in increments of five or ten degrees. The figures marking the degrees may be read from either side of the card. These curves indicate "course angles," the course angle in any evolution being the angle between the course of the guide and the course of the maneuvering unit when proceeding from its present to its new position relative to the guide.

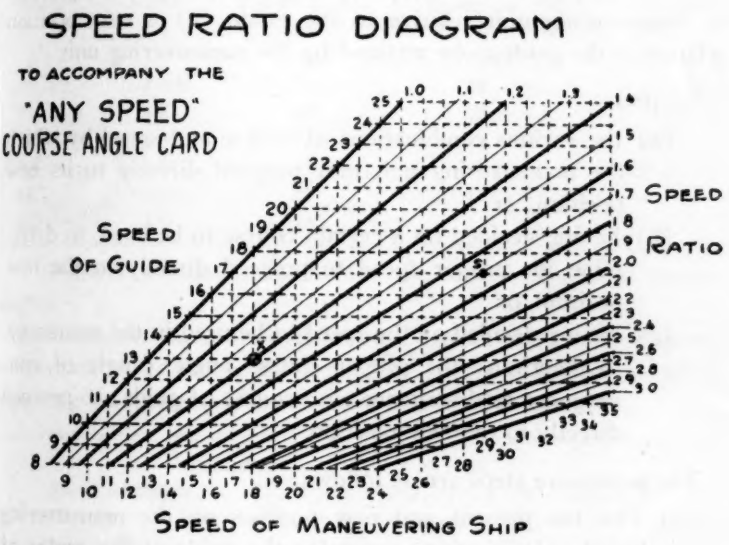


FIG. II

The movable arm B pivoted at C bears a scale from 1.0 to 2.5 so marked as to be conveniently read from either side of the card. This scale is the speed ratio scale, the figures representing the ratio of the speed of the maneuvering unit to the speed of the guide.

For convenience in obtaining this ratio for different speeds, the card is accompanied by a small diagram shown as figure 2. This diagram can be printed in one corner of the mooring board diagram. Its use is more or less obvious. The vertical lines repre-

sent the speed of the maneuvering unit, horizontal lines the speed of the guide, diagonal lines the speed ratio. The intersection of any two lines indicates the third. Thus—speed of maneuvering ship, 29 kts.,—speed of guide 17 kts., intersection is at point S, giving a speed ratio of 1.7. Or, speed of guide 13 kts., speed ratio (for a certain course angle) 1.4, intersection is at point X, and speed of maneuvering ship is 18 kts.

### Method of Using the Course Angle Card

The general case for the use of the "Any Speed Course Angle Card" is as follows:

Given—(a) Course and speed of guide (b) present position of maneuvering unit relative to the guide (c) a new position relative to the guide to be attained by the maneuvering unit.

To find—

(a) the various combinations of course and speed by which the maneuvering unit may proceed directly to its new position, or

(b) having decided on a certain course to be used, to determine the proper speed to proceed directly to the new position, or

(c) having decided on the speed to be used in the maneuver, to determine the proper course angle (angle of convergence or divergence with course of guide) to proceed directly to the new position.

The successive steps are as follows:

(1) Plot the present and new position on the maneuvering board (H. O. 2665) assuming the guide at the center of diagram and the guide's course 0°.

(2) Place the card on the maneuvering board with the central point "C" over the present position $P^1$, and the curved edge of the card to left (as shown in diagram 1) or right, according as the new position $P^2$ is to the left or right of the present position.

(3) Orient the cord so that the parallel lines are parallel to the vertical lines of the maneuvering board, (the course of the guide as assumed in plotting).

(4) Holding the card in this position rotate the arm B until the line of the speed ratio scale (or this line produced) falls on the new position $P^2$.

The information desired may now be obtained directly by reading the various intersections of the speed ratio scale, and the course angle curves, interpolating if desired.

In the case illustrated by diagram 1, the card indicates that a unit may proceed directly from a position $P^1$ to a position $P^2$ by any of the following maneuvers (among many others):

| *Course Angle* | *Speed Ratio* | *Maneuver Speeds (from Fig. 2)* *Guide 13 Kts.* | *Guide 16 Kts.* | *Guide 19 Kts.* |
|---|---|---|---|---|
| 5° | 1.1 | 14.5 | 17.5 | 21. |
| 10° | 1.2+ | 15.5 | 19. | 23. |
| 15° | 1.4 | 18. | 22.5 | 26.5 |
| 17° | 1.5 | 19.5 | 24. | 28.5 |
| 20° | 1.67 | 21.5 | 26.5 | 31.5 |
| 25° | 2.0+ | 26. | 32. | ... |
| 29° | 2.5 | 32.5 | ... | ... |

The above combinations include the more convenient course angles.

If the unit commander decides on a certain maneuvering speed, and wants to obtain the corresponding course angle, the information may be obtained from the card in a similar manner.

| | *Maneuvering Speed 25 Kts.* | |
|---|---|---|
| *Speed of Guide* | *Speed Ratio (Fig. 2)* | *Course Angle* |
| 10 | 2.5 | 29° |
| 12 | 2.1 | 25½° |
| 14 | 1.8 | 22° |
| 16 | 1.6(—) | 18° |
| 18 | 1.4 | 15° |

This course angle card may possibly prove convenient in other problems when the speed ratio is greater than unity.

For example:

Suppose destroyers are closing the main body, speed 25, courses converging 60°, speed of fleet 12½. Here the speed ratio is 2. and course angle 60°.

Plot present position $P^1$ relative to the main body (which is assumed at center of maneuvering board). Place "C" over $P^1$ and orient card to the course of the main body.

Place arm B so that the point 2.0 of the speed ratio scale lies on the 60° course angle curve. Make a mark on the maneuvering board at the outer end of the speed ratio scale, remove the card and connect $P^1$ with this mark. This line is the line along which successive positions of the destroyers should plot as they approach the main body.

Similar problems suggest themselves in connection with torpedo fire.

As has been previously stated, this "Card" is not a substitute for the usual methods of the maneuvering board, or of the more valuable and more convenient "Universal Drafting Machine" when used by experienced officers under favorable conditions. It may, in its simplicity and directness, however, prove useful in the maneuvers of light vessels stationed at a distance from a fleet guide.

# AUTOBIOGRAPHIC SKETCH OF THOMAS JEFFERSON PAGE

SUBMITTED BY COMMANDER R. S. CRENSHAW, U. S. NAVY

FOREWORD

In submitting this autobiographic sketch to the Institute, Commander Crenshaw gives the following account of the circumstances under which it was written:

In 1895 a relative of mine, Mrs. Sally Nelson Robins, obtained from the "Old Commodore" this short account of a life full of action. Since then it has been stowed away in family trunks until accidentally found recently and sent me for reading. Captain Page was named for Thomas Jefferson, who drafted the Declaration of Independence at his grandfather's home "Rosewell," in Gloucester County, Virginia.

The footnotes signed "S. N. R." are by Mrs. Robins, mentioned above. A number of editorial notes have also been inserted where the text seemed not entirely clear.

The sketch is interesting not only by reason of the entertaining manner in which it is written, but also for the valuable picture which it affords of life in the Navy nearly one hundred years ago.

EDITOR.

Rome, October, 1894

I WAS born in 1808 in Gloucester County, Virginia, where, at the time of my birth, my family had been established for over two hundred years. This extensive landed property in Gloucester, a fine estate lying for ten miles on York River, had descended from father to eldest son without interruption. Two young brothers had settled in other counties of Virginia, and left numerous descendants, but the older branch still consider Gloucester County as its home.

My father was the eldest son of Governor John Page, the head of the house, as Englishmen would say. During the War of Independence, by a too large and generous hospitality, the fine old property of Rosewell became embarrassed. My father was a successful lawyer and gave promise of distinguished career, and my grandfather vainly hoped that he would occupy his place in the old Rosewell mansion and retrieve the embarrassment of the vast property, but my father died young, and a large part of the Rosewell estate passed into the hands of strangers. A few hundred

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acres still remain in the family, the property of my nephew. It is now approaching three centuries, and in a country like ours, where property is constantly changing hands, it is, perhaps, worth noting that this property, now owned by my nephew, has never for a day been mortgaged or passed from the family.

My mother was Elizabeth Nelson, daughter of Thomas Nelson, signer of the Declaration of Independence. Nelson, like many Virginians of his day, was chiefly educated in England, where he was sent at the age of fourteen, and remained seven years under the guardianship of Beilby Porteus—Bishop of London. Nelson's English education did not blind him to the injustice of England's treatment of her colonies. He became an ardent and sincere patriot and showed his sincerity in personal service and great pecuniary sacrifices. He became War-Governor of Virginia. During the war, Washington wrote him that the cause was lost without money to pay the troops, etc., etc. Virginia had at that time neither money nor credit, but Governor Nelson, considered at that time the richest man in the colonies, was told that on his personal security plenty of money would be forth-coming. The Governor did not hesitate, he mortgaged his estate and gave personal security for two millions of dollars.*

At the close of the war Nelson's fortune was gone and his health ruined. Asthma, contracted in the war, by exposure, carried him off a few years after its close. Not a dollar of this debt has ever been paid by the United States to Nelson's children or descendants.

The only acknowledgment of it ever received was the sending to my mother (his oldest daughter) during the administration of John Quincy Adams of two appointments for West Point. She accepted only one, and I, her youngest son, was sent off to West Point. I had never been out of Virginia before or much away from my mother, and arriving at West Point, I became fearfully homesick. I went to Colonel Thayer, commandant, and told him I must go home. "Go home?" he exclaimed. "Why?"

"I shall die if I stay here."

The Colonel, perhaps, saw that my distress was genuine, so he

*During the drive for the first Liberty Loan in the spring of 1917 the inscription on Governor Nelson's tomb at Yorktown—"He gave all for Liberty"—was used as a slogan.—S. N. R.

spoke kindly and said, "If you go, you must go at once. After your examination you cannot leave without permission of your guardian."

I thought I had money to take me home so I started. When I reached New York I found a schooner bound for Richmond, the captain put me off at Jamestown after a nine days' passage.

Never can I forget my poor mother's consternation when, utterly unaware of my proceedings, I walked into her room. I was heartily ashamed and perhaps it influenced my conduct for life; for I determined that never again would I, by my conduct, cause my gentle, good mother grief. Soon after, through the influence, I think, of one of the Tripolitan heroes, Commodore Warrington, who was a friend of the family, I received the appointment of midshipman in our Navy.

### My First Cruise in the Navy

In October, 1827, I received the appointment of midshipman from Mr. Southward, then Secretary of the Navy. My first order after appointment was to the school at Gosport Navy Yard. Our only professor was a gentleman called familiarly the schoolmaster, our only Academy building a receiving-ship. The principal was to teach navigation and the use of the instruments. Fortunately I had been well trained in Mathematics before entering the Navy by my old Scotch tutor, Mr. Bruce; and I now tried to make the best of my time under the schoolmaster's direction, but my time was short.

In the spring I was ordered to the sloop-of-war *Erie*, bound for the West Indies for a three years' cruise, and during that time I saw much hard service. There were frequent changes of officers, four different commanders all competent professionally, but two of them very severe disciplinarians. I was so fortunate as to get along with them all; and I have no punishments or suspensions to record.

During this cruise it fell to my lot several times, to navigate the ship owing to the absence or illness of the sailing-master. One of these occasions was when the *Erie* was flagship, Commander Elliott Montgomery, commanding, bound for Havana. We sailed from Pensacola accompanied by the U. S. Brig *Dolphin*. Lieutenant Wolsey, her captain, was an accomplished officer, and a great

favorite of the Commodore, with whom he had before made a cruise.

It was the custom for all ships sailing in squadron to report their position daily at noon to the flagship. A few days out the reckoning of the *Dolphin* differed very much from that of the *Erie*. I was but a green midshipman and as was to have been expected, the Commodore was disposed to adopt the *Dolphin's* reckoning. I was very mortified but Captain Montgomery, who was justly considered one of the finest officers and most gentlemanly men in our service, befriended me. He called me into his cabin, and asked me if I was sure of the accuracy of my calculations to determine the *Erie's* position. I told him I fully appreciated the importance at all times and under all circumstances of a correct reckoning, but on this occasion, knowing that my work would be compared with that of an experienced sailing-master, I had revised my calculations, and that unless the rate of the chronometer had changed since leaving Pensacola, which I had no reason to suppose, I was confident that my work was correct. Much to my delight Captain Montgomery said: "The ship shall be navigated by our reckoning, I believe it is right."

My calculation must soon be tested. If correct, we should make the Moro Light, a revolving light at the entrance to Havana harbor, at about two o'clock in the morning. That night I had the first watch from eight o'clock to midnight. When it ended I was too excited to turn into my hammock and sleep. About half-past-one I went up and asked permission of the officer on deck to go up on the fore-top-sail-yard to watch for Moro Light. Permission was granted, and so I went to the foretop and told the captain of the top to send up with me on the top-sail-yard the sharpest-eyed man in his watch. I sat on the starboard side of the topmast, and the man on the port-side. I said to him: "We are expecting to make the Moro Light, so keep a bright look ahead and sharp on both bows." Then I chatted a little to keep his eyes open. We had not been there a half-hour when the man exclaimed: "I think I see a light, sir." "Where away?" "About a point, sir, on the starboard bow."

I now saw it myself, but to feel assured, I waited to see another round. There was no mistake; very excited I turned my head

aft and shouted with all my strength to the officer of the deck: "Light, Ho!" "Where away?" said the officer through his trumpet. "One point on the starboard bow." I called out and hastened down. The light was then visible from the deck, and when I asked permission of the officer to report to Captain Montgomery, he said, "Go report to the Captain!"

I awakened Captain Montgomery who seemed delighted and said, "Go report to the Commodore." The Commodore was asleep, but I awakened him and said: "We have made the Moro Light, sir." The Commodore, however, seemed less pleased than Captain Montgomery. I then turned into my hammock and had a good sleep.

Perhaps this little episode of my first cruise was of service to me afterward. It was the custom in those days, for Commanders to give midshipmen who had sailed with them letters of recommendation for the Board of Examiners. I heard, after my examination was over, that Captain Montgomery in his letter alluded to the affair of the Moro Light.

During the three years' cruise of the *Erie,* so often were the officers changed, from the Captain down, that at the end of the cruise, I was the only midshipman who had sailed in her at the beginning. Midshipmen would often say to me "Page, when will you go home?" My invariable answer was "When I command the *Erie.*" There is many a true word spoken in jest. What seemed so impossible and improbable for me, a middy in my teens, actually came to pass before our cruise was ended.

We had put into Port-au-Prince, Haiti, to water ship. We found a stream of clear, mountain water emptying into the sea near the anchorage of the *Erie.* I was in charge of the launch and sixteen men whose duty it was to bring water. After a few days I thought the men were receiving grog from some unknown source. My suspicions were confirmed by finding some bottles of rum concealed in the bushes bordering on the stream. My putting an end to this contraband traffic so enraged the natives that they completely put a stop to our watering. The next day we found the stream muddy, and the water undrinkable. Our men said it was caused by rain in the mountains, but I understood perfectly that it was the work of the natives. Fortunately we had nearly completed our supply.

The very next day yellow-fever broke out among the crew, and the Captain undoubtedly adopted the wisest course; he immediately put out to sea. But so rapid was the progress of the fever, that before we were out of sight of the coast of Haiti, the Captain, all of the lieutenants, save one, the sailing-master and forty of the crew were down with fever. The one lieutenant not on the sick list had, a few days before, been suspended from duty. Captain Clack, the last Commander of the *Erie*, was a rigid disciplinarian and sooner than restore the suspended officer to duty, he sent for Midshipman Jones and myself and gave us written appointments as acting lieutenants; at the same time turning to me he said "You are navigating the *Erie*, take her into Norfolk."

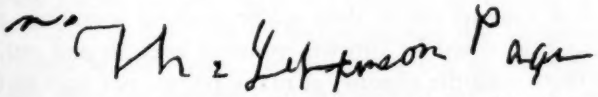
It was heavy work: Jones and I kept watch and watch and in addition I did the work of sailing-master. Off that stormy region, Cape Hatteras, we encountered a squall and sail was reduced to top-sail. Cape Hatteras was not far to leeward, I did not think it safe to run the ship off the usual course and I determined to have recourse to an evolution not often adopted or approved. The moment seemed favorable, so we luffed. I gave the order to the quarter-master at the wheel: "Luff, and the instant you see the weather-leech of the top-sail shiver, put the helm up!" This was promptly done, the yards came down, the sails were double-reefed, and the ship made snug to stand the storm. We know the old adage "necessity knows no law," this evolution was justified by its success. We carried the ship safely in to Norfolk anchored off the Navy-Yard hospital and sent all our sick ashore without the loss of a man during the passage from Haiti.

Thus, for eight or ten days I had actually commanded the *Erie*, for the surgeon had earnestly advised me to make no reports to the Captain whose life, perhaps, depended on being kept quiet.

After the sick had been safely taken to the hospital, the remaining officers were detached, the crew discharged and the good sloop-of-war *Erie* laid up. I was again ordered to the Navy school to prepare for my examination.

In a few months I was ordered to report to the Board of Examiners at Baltimore; composed of three commodores—my examination in seamanship was chiefly by Commodore Shubrick, and the examination began after I delivered to this board the letters given me by the different captains under whom I had sailed. In answer to some questions from the board I explained the evolution I had made off Hatteras, and the circumstances that led to it. The examiners, never by word or look, expressed approval of my answers, but I received the best proof of their approval in their ranking me number one in a class of forty. Soon after my examinations, I was sent to join Mr. Hassler who had been made director of the coast-survey about to measure the base-line of Fire Island.

In looking back on the years of my professional life, I recall with great satisfaction the period of my service on the coast-survey, then having as director Mr. Hassler, a German-Swiss, and a scientist of great ability, who initiated the great work which has been continued by his successors for over forty years. (Ed. Note: Now over ninety years.)



The various papers sent me from Rome were always signed in these trembling, uncertain characters.—S. N. R.

I was, as a past midshipman, with Mr. Hassler in the initiatory work, when he measured the base-line of Fire Island. On completion of the measurement of this base-line, I was, by Mr. Hassler, transferred as the second in command to the hydrographic party, Captain Gedney commanding, then about to engage in a survey of the Harbor of New York and the approaches to it from the sea.

Three points on Sandy Hook previously determined by the coast-survey were occupied by me and two younger officers (midshipmen). We were then stationed as overseers to determine the position of the surveying vessel as she made signals for that purpose. By the vessel, lines in every direction were run out, as she crossed and recrossed the bar from the point of Sandy Hook out to deep water beyond the bar, the soundings and signals

to the observers on shore being made as rapidly as possible. I was living in a tent, but I rented a small room from the Light-house keeper for the purpose of bringing up my work. There I made all the mappings, the projection of angles and the laying off of the soundings.

In tracing lines through the deepest waters, a continuous line of deep water was revealed; that is a new channel two feet deeper than the old channel used by pilots. I immediately reported this to Captain Gedney. His answer was, "Impossible!" I asked him would he come and see. He came, examined the chart and saw the new channel traced out to deep water. He expressed astonishment but evidently doubted. Perceiving this, I suggested that he, himself, should examine the new channel in the surveying vessel. To this he assented. The New York Pilots were considered the most skilled and intelligent of the country, but not one had ever reported or even suspected the existence of a new channel, so my professional pride was roused, and I watched and waited anxiously for the verification of the work.

The chart was put in the surveying vessel, and by it she ran the new channel out to deep water, making soundings as rapidly as the lead could be thrown, running lines in and out, crossing and recrossing the channel at many points, not only to determine its width, but to make sure that no shoal spot could be detected. Captain Gedney was convinced, but the pilots were not. The question was soon to be definitely settled.

A large French frigate had come into New York. When she had taken in stores and water her draught was so increased that the pilot who had brought her in told the Captain he could not take her out. The commander of this frigate had heard of the newly-discovered channel and called on Captain Gedney for information. Captain Gedney told him that if he would follow, he would lead the way through it in his surveying vessel. The French Captain accepted, we piloted him out safely, and sent him on his way rejoicing. Thus the existence of the new channel was proven beyond doubt, and from that time on, it has been known as the Gedney channel. With the present colossal steamers what would New York do without it?

EDITOR'S NOTE: Before the dredging of Ambrose Channel.

After this I continued with the Coast Survey, working with the Hydrographic and the Triangulation parties until the winter, when I was ordered to Washington. It was the custom, then as now, for all naval, military and civil officers engaged in public work at a distance, to repair to Washington during the winter to bring up the work of the preceding season; indeed Washington was the headquarters of the Coast-Survey. I happened to find myself in a boarding-house with M. Nicollet, a French scientist, and if I am not mistaken, an ex-admiral of the French Navy. At this time he was employed by the U. S. Government, and engaged in examining the head waters of the Mississippi.

I was much interested in his work, and though the social attractions of the capital were considered very tempting I found the calculations of M. Nicollet very much more to my taste. I assisted him, in my leisure moments, in bringing up his work and was glad to be associated with so distinguished a man of science. Often into the small hours of the night and beyond, we worked. The following spring M. Nicollet was to explore for the U. S. Government the Rocky Mountains and the country beyond to the Pacific Coast. With my consent, he applied to the Navy Department to have me in his party, and the Department promised orders to that work, though rather out of our line.

At the last moment domestic affairs obliged me to ask to be relieved. Nicollet was very angry and with French vivacity he reproached and almost wept over my want of ambition. "You, for your age," he said, "so good a mathematician, I would have made you one of the best scientists of your country."

When he calmed down a little he asked if I knew any one to take my place, and I replied, "Yes, there is young Frémont of the Topographical Corps, he has the reputation of being one of the cleverest young men in the Army." M. Nicollet, with Frémont's consent, applied for him and the War Department gave the young officer orders to join the Rocky Mountain exploring party. We are all familiar with the after career of Frémont.

From the coast-survey service, I was ordered to the line of battleship *Columbus,* Captain Lorillard Spencer, flagship of Commodore Morgan commanding the Mediterranean Squadron. In going out we touched at Maderia. We took in during our short stay, a good supply of Maderia wine, not knowing how precious

it would become, for a little later the disaster of the vines nearly banished this favorite wine from our cellars. We wintered at Port Mahon at that time the rendezvous of nearly all the squadrons of the world in the Mediterranean in winter.

The following year we wintered in Genoa, where we were treated with great hospitality by the inhabitants. The good old ship was much visited, and as she had a fine deck and we had an admirable band, little dances aboard were frequent. Our ship had been given a safe anchorage under the mole, and under that protection she was moored head and stern. And well it was so, for during that winter Genoa experienced such a gale as had never been known in her history. A part of the mole was carried away, and for a time the ship seemed to be in some danger, but we escaped unharmed though immense damage was done to the shipping in port. On the third day there was a great religious procession with the bones of John the Baptist, patron saint of Genoa, and soon after the gale abated, which was, of course, attributed by the faithful to the intercession of the saint.

The beautiful Opera House Carlo-Felice was open, and our officers found it a source of great pleasure. We heard there the Diva of her day, Clara Novella, who afterwards was known in England as the greatest living Oratorio singer. To this day in England she is mentioned as the Diva of Oratorio Music. After nearly or quite half a century I have the pleasure of knowing the great singer as Countess Gigliucci, widow of Senator Count Gigliucci, an Italian nobleman, and to find that her sons and daughters are the friends of my children. The Countess seems to retain much of the vivacity of youth, and is a woman of great intelligence. It is said that few archaeologists can give a more intelligent account of Rome—ancient, medieval and modern. Within a long distance of the Eternal City every road and ruin and stone seems to have its history for her, and a lady who is frequently invited to accompany her, says the drives of the Countess Gigliucci, must be almost as instructive and charming as the "Archaeological Walks of Lanciani."

Our stay in the Mediterranean terminated as follows.

What is now known as the South Atlantic Squadron was, in those days, of our cruise in the *Columbus*, known as the Brazil Squadron. The Navy Department had just made an admirable

rule, that the Brazil and Mediterranean ships should, during their cruise, exchange stations. In the spring following our winter at Genoa, Commodore Morris, commanding the Brazil Squadron, came into the Mediterranean in the *Delaware*, his flagship, to exchange with Commodore Morgan. Previous to the separation of the squadron Commander Morris as senior officer exercised the ships in fleet-sailing, evolutions, etc., and after signals of adieux and good wishes had been exchanged, Commodore Morgan's Squadron sailed for Brazil. That was the first and last time that the admirable rule of squadron exchange was put into practice!

Among the most interesting events of our cruise on the South American station was the arrival in Rio de Janerio of a Neapolitan fleet escorting a young Bourbon princess who was to be the future Empress of Brazil. Never before or since has the beautiful Bay of Rio, witnessed a more brilliant and animated scene, than that attendant upon the arrival of the princess, then but eighteen years old. The Emperor Dom Pedro came off in a splendidly equipped barge, with a brilliant following of courtiers to meet his bride, and passed, going and returning, through a long line of ships, for the fleets of all the navies of the world seemed for that occasion to be assembled in the Bay of Rio, where salutes and cheers and manning of the yards greeted the young couple at every moment. The Emperor had never seen his bride till the day of their marriage, but it is said their union brought great happiness and this foreign princess not only made an exemplary and much-loved wife, but was greatly loved and respected by the Brazilians.

One who lives to the age allotted to man and many years beyond, witnesses strange vicissitudes of nations and individuals. This young couple who began life under such brilliant auspices were destined to die in exile. Nearly half a century after the events I have related, I was residing at Florence, Italy. The Emperor and Empress of Brazil, not then in exile, that was to follow a year or two later, were wintering in the Tuscan city; the Emperor broken in health, and seeking only rest and quiet. It was the first visit of the Empress to Europe since leaving Naples as a bride, and she was much affected in revisiting her old home. Perhaps no contemporary sovereigns were more beloved by their subjects, and more worthy of it than those of Brazil, and none

governed a country which for territorial extent and material resources offered a greater future; and yet those sovereigns, so exemplary in their lives and governing so wisely ended their days in exile.

In 1844 the *Columbus* was ordered home to be put out of commission, and I was ordered to the Naval Observatory, then directed by Matthew Fontaine Maury, one of the most distinguished and best known scientists of his day. It was not an easy berth, for day and night in good weather, I was at work with the Muriel circle. The Observatory was in its infancy and its character before the world was to be established. Placed thus upon our mettle, we all labored diligently in consequence. After three years of Observatory routine I was ordered in 1848 to the corvette *Plymouth,* Flagship of Commodore Geysinger, my old captain, Gedney, commanding, under order to the China station. After our arrival Captain Gedney, who was always, more or less an invalid with rheumatic gout was so seriously ill as to be obliged to live ashore, so I was really commander of the *Plymouth.*

Soon after our arrival in China, there occurred one of those terrible and much-dreaded typhoons. An English brig with a very valuable cargo of opium was driven ashore in the gale. I sent two boats well officered and manned to protect her from the hordes of Chinamen who like birds of prey waited to fall upon her. Her captain was unwilling to put his vessel under the protection of the *Plymouth,* or even to acknowledge his dangerous position; but his officers and men assured him in a body that they would abandon the brig and save themselves if he did not accept the assistance. The Captain then yielded, and after much hard work the *Plymouth* men dragged the brig off to a safe anchorage. Under British rule the brig and cargo would have been considered total losses, and the salvage due one-half the value of ship and cargo. As the owners of the brig and of the cargo had the reputations of being honorable men, the claim of the *Plymouth* crew was considered safe in the hands of their referees. The justice of their decision was in advance considered by us as unquestionable. What was our disappointment in finding that those just referees had only awarded one-tenth of what was due the crew.

This decision taught us a lesson; should another chance of salvage come to us, we would look out for our own interest and hold possession of our prize in waiting for a just decision.

Two years later I was appointed to the command of the brig *Dolphin,* her commander having been sent home invalided. At that period the China sea was infested by piratical junk-ships, and a vessel becalmed would find herself surrounded with little chance of escape. The *Dolphin* was ordered to cruise around and hunt up these piratical junks, for they had lately come into evidence, by capturing and robbing a fine English ship which had been becalmed with a valuable cargo of cotton in the China Sea. I found in the harbor of Cunsingmoon* two junks in the very act of sending cotton ashore; for Cunsingmoon, at that time, was a rendezvous for the pirates who had many confederates in the place. I sent two armed and well-manned boats to board and capture them. As our men boarded on one side, the Chinamen went out on the other, jumping overboard and swimming ashore like ducks. Many of the owners' marks were in my possession, and as the bales of cotton aboard had the same marks there could be no doubt as to the character of the junks. We took them in tow, sailed for Macao Roads and reported to Commodore Geysinger, flagship, *Plymouth.* The junks were handed over to the senior British officer, Captain Dalrymple, at Hong-Kong, where under decision of the Court of Admiralty they were condemned.

This capture, small and insignificant as it may seem, tended in a certain degree to lessen the frequency of the piratical attacks on becalmed ships.

When I reached California on my homeward journey an extraordinary condition of things obtained. One might as easily have turned the waters of Niagara as the human current then rushing to the gold mines. Many merchant ships were tied up for want of crews, several men-of-war were in no better condition. Prices of all necessary articles of clothing and food placed them beyond reach of those without a "pile." The officers of the naval vessels there had to content themselves with ships' rations. An officer of one of our men-of-war was a good sportsman, and found game enough to supply his mess, and sold enough

*Editor's Note: This place cannot be located. Possibly refers to *Kongmoon* which is near Macao.

at the same time to get his ammunition. A gentleman thinking he was making a liberal offer told a negro if he would take his trunk to the hotel, he would give him a dollar. The negro replied "Take it yourself and I will give you five dollars."

The *Dolphin* needed caulking, both in her deck and her upper works, I employed workmen for the purpose, but so exorbitant were their prices, that I dismissed them and determined to complete the work at the Sandwich Islands where though prices were high enough, we found them much more reasonable than those of San Francisco.

At Honolulu I met Captain Kellett in command of an English surveying squadron; they had nearly completed their surveys on the Island and it would be difficult to find better work than the chart made by that party. Captain Kellett afterwards went to the Arctic Ocean, and had a dramatic experience in saving McClure's party. McClure had passed from the Pacific to the Atlantic, but only by abandoning his ship in the ice. Some years later in returning from my first LaPlata Expedition I touched at Jamaica and there at a dinner given by the Governor I met again my old acquaintance, Captain Kellett who, as admiral, was in command of the West India Squadron.

Leaving Honolulu I proceeded homeward touching at Valparaiso for water and provisions. There was no railroad at that time to Santiago but accompanied by two officers I went by carriage to the capital on a short visit to our Minister, Mr. Peyton of Tennessee, who returned with us to Valparaiso and was received on the *Dolphin* with all the honor due his rank as representative of the United States.

Having taken in water and stores, necessary for a long voyage, we sailed for New York; doubling Cape Horn we ran into one of those terrible gales frequent enough in the latitude of the cape. I had been advised by my predecessor in command of the *Dolphin* never to scud the brig, but here was a case when it became necessary, for to "lie to" (the only other alternative) would have involved a great loss of time. Though blowing a gale, the wind was fair from the West; and I put the *Dolphin* before it; under close-reefed foretopsail, and reefed foresail. As may be well imagined, it was an anxious moment, as I watched closely the behavior of the brig. Landsmen often hear the expression "Seas

mountain high," but only those who have been caught in a gale off Cape Horn, can fully comprehend this saying. The seas on this occasion were frightful, literally mountain high, and those mountains fell upon us in such quick succession that it seemed as if only by a miracle could our little craft escape engulfment.

After about twenty-four hours of the battle with the elements we ran out of the gale. We soon sighted the Falkland Islands, and with fine weather, stood on for our destination New York. None but a mariner can understand the relief of a commander and crew in escaping from such a gale as that we encountered off Cape Horn, and in a small man-of-war by no means capable of battling against typhoons and Cape Horn gales.

On approaching Sandy Hook we witnessed a remarkable sight, for we suddenly ran into a dense fog bank, so dense that I was obliged to fire a blank cartridge to attract attention of a pilot. Our signal was answered by a horn and so near was the pilot that in two or three minutes he was alongside guided by the report of the gun and our voices. We soon ran out of the fog into bright sunshine in company with hundreds of ships moving in and out. In looking back there was the bank, smooth and precipitous as the side of a great house. The *Dolphin* arrived off the Navy Yard, officers and men were put on leave, the old brig laid up for repairs and a cruise of three and a half years happily ended. I proceeded to Washington, D. C., where my family resided.

In after years I lived on an estancia of five leagues square. It was well-stocked with fine animals, and I fell into the habit of observing them closely and found such intelligence and sagacity as to be at times almost startling. At the period of my return from the long voyage I have noted, I was less familiar with animal life and therefore more impressed by the affectionate greeting of a favorite dog, a splendid example of the Newfoundland race. When I left home he was a fine puppy of nine or ten months old. When I returned he was as big as a donkey.

While seated in the drawing-room surrounded by my family, one of the children said: "Let us call the dog to see if he will know father!" The great creature walked in, and I kept still and silent, while he moved about the room as if watching the children, and then went into an adjoining room communicating by double-

doors with the room where I sat. Motioning to the children to keep quiet, I rose and called out "Prince!" He came back into the room, stood in attentive attitude near the door. Again I called "Prince!" With one bound he was beside me, a paw on each shoulder, looking at me as if he would speak. Then he rushed around the room barking joyously. He ran back to me again placing a paw on each shoulder as if to embrace me, and in that attitude he remained for a minute or two, very quiet and looking into my face with a most touching expression of intelligence and affection. It is rare to see even upon a human face such an expression of love and joy. What is the mystery of the animal world? Will it ever be revealed to us? That noble dog recognized me after an absence of three and a half years.

EDITOR'S NOTE: There is a hiatus in the memoirs between 1852, date of return of the *Dolphin* from the China station, and the outbreak of the Civil War. In this period Captain Page seems to have been employed in two expeditions of exploration on the La Plata River. There are a few comments scattered later on in the MSS. in regard to this work, which seems to have been so successful, and of so pleasant a nature that after the Civil War Commodore Page returned to the Argentine and settled there.

Rome, September 12, 1894.

Early in the year 1861, I arrived in Washington with the rough charts, journals, books, instruments, etc., of my second exploration in the waters of La Plata and the riverine countries; Uruguay, Argentina, Bolivia, Brazil and Paraguay. Bolivia can hardly be called a riverine country although a portion of its territory touches upon the river.

While preparing for publication of this work, I was informed that my native land Virginia, had seceded from the Union. I immediately sought an interview with the Secretary of the Navy, and I tendered him my resignation and commission. After some remarks disapproving of secession, to which I made no reply, he asked me kindly to, reflect before abandoning my position in the U. S. Navy.

I replied: "I see that war is pending, and I can't conscientiously draw my sword against my native state. I was born in Virginia, was appointed, as you will see in the Navy Register, from that state, and I am registered as a citizen of Virginia.'"

He said: "You have not been called to draw your sword against Virginia."

I replied that I was unwilling to occupy a position in the Navy, in which I should be exempt from orders to which every other officer would be amenable." He then said, "Keep your commission, reflect well upon your decision, and come to see me tomorrow."

Obedient to this order, I went the next day to say that my resolution was unaltered: I handed him my resignation and commission and they were accepted. Passing into the room of the chief clerk, I delivered to him the key of my office where were the cases containing the papers of my second exploration alluded to above, telling him that the work had been examined by a board of officers as required by an act of Congress relating to all such work and reported to the Secretary of the Navy in complimentary terms as highly worthly of publication.

It is very much to be regretted that this very important work, that would be useful to our commercial population, and would extend knowledge of a region then, and still, unknown should be allowed to remain unpublished. I informed the chief clerk that any officer familiar with hydrographic work could prepare those charts and papers for publication.

Before leaving the office of the chief clerk, he asked, "Why do you resign? Do you expect promotion?"

I replied, " No, I expect impoverishment."

He then said, "If those are your sentiments, I have nothing more to say."

Previous to leaving Washington, I was much surprised by a visit from the Minister Plenipotentiary of a European power accredited to our Government. He informed me that having received instructions to invite an officer of the U. S. Navy to enter the service of his country with the rank of Admiral, he wished to offer me the position. With many thanks I told his Excellency, that at such a moment I could not leave my country. I must choose between North and South, and that as a Virginian I must go with my state. His Excellency was sanguine that actual war between the North and South was impossible. He then said, "I am confident there will be no war, and I give you three months to reconsider your refusal."

The day following my last interview with the Secretary of the Navy I left Washington for Richmond, accompanied by my

two sons. When I reached Richmond, I called on Governor Letcher, who ordered me to report to General Lee. General Lee assigned me to duty in his office, and later to Gloucester Point for the construction of defenses and the command of that important place on York River.

EDITOR'S NOTE: During the late World War the Atlantic Fleet based at this point.

I remained there till the abandonment of Yorktown, Gloucester Point being a part of that command. For several months the enemy bombarded us with their long-reaching guns throwing shells into, but generally far beyond the works. Our guns, though good of their kind, did not reach the enemy. The men of my command, unused to such projectiles, soon discovered that they were less dangerous than they had imagined. This was demonstrated to them by one of these shells plunging not more than six feet from the door of my tent, near the flag-staff, exploding and covering me with dust, but doing no damage.

Later in the Civil War I was sent by the Confederate Government to Europe to purchase an iron-clad for its Navy.

The pages descriptive of the purchase of the iron-clad are unfortunately missing from the MS. Only the portion descriptive of the return can be found. This follows.—S. N. R.

Soon after this* we had fair weather and put into Dieppe for coal and to take on board the agent of the builders. We then steered for our appointed destination off the coast of France. We had not anchored many hours when we espied a steamer approaching us, and she soon anchored near us. Here the Captain, crew and builder's agent left us, and I gave the latter a certificate that he had delivered to me the iron-clad. In taking leave of me, the captain who was as good a sailor as ever stepped a deck, said: "I would not attempt to take this vessel across the Atlantic if they would give her to me."

The Danish flag was immediately hauled down and from the steamer near us there came officers, crew, ammunition and provisions. In the presence of all on deck, the Confederate flag was hoisted at the peak of our little iron-clad and her name declared

*EDITOR'S NOTE: The iron-clad had apparently been completed, and had sailed from England. She seems to have run into heavy weather.

"Confederate States Steamer *Stonewall.*" Under direction of the Executive officer, Robert Randolph Carter of Virginia, everything was soon placed; the men watched, quartered and stationed, and the little craft made ready for her voyage across the Atlantic.

Here I must describe the *Stonewall!* She was brig-rigged, had twin screws and was of about twelve hudred tons displacement; her maximum speed was eight or nine knots; armor plating four and a half inches with a spur from the bow of about six feet. Her armament consisted of one three hundred pounder Armstrong muzzle loading gun, mounted in the bow, directly in the line of the keel, and two seventy pounder muzzle loading Armstrong guns, one on either side, mounted in a fixed turret about midships. Her deck had about four feet free-board with a bulwark of iron about the same height, designed only to keep out the water and to be lowered in time of action.

Her crew consisted of about forty-five men. When we left our anchorage the weather was fine, and all aboard looked forward sanguinely to a prosperous voyage to our destination, the Confederate States. But "Man proposes and God disposes." That night when fairly in the Bay of Biscay we encountered a severe gale which tried to the uttermost the capacity of the *Stonewall* (which was only designed for harbor and coast defense) as a seagoing vessel, the gale continued three days, the *Stonewall* being often literally under water.

The steamer, alluded to as having come to meet us, accompanied us for some distance, for the captain, as he afterwards affirmed, felt very anxious about the safety of the *Stonewall.* He said he exclaimed several times when he saw her disappear, "She is gone!" He signalled, "How do you get on?" The answer was, "All right, go ahead!" I knew that the steamer had other, and very important work, and that she should not be detained.

The weather so retarded the progress of the *Stonewall,* that we had no hope of reaching our destination for coaling. Since leaving the anchorage we had not been able to make a single observation to determine our position, but by the best calculation we could make of her run, we supposed we were off that part of the Spanish coast where are the two towns, Ferrol and Corona. The *Stonewall* had been badly damaged during the gale, and our supply of coal was nearly exhausted. We concluded if possible

to make one of the Spanish ports, consequently the vessel was headed for the coast which brought the wind aft. The reefed foretopsail was set, which, together with her steam, kept her ahead of the combing sea, and we soon had the satisfaction of sighting the crescent-shape coast where were the ports we hoped to strike.

During the gale alluded to an accident occurred to the *Stonewall* which nearly proved a disaster and which would have obliged us to seek a port, even if our coal had not been exhausted. The accumulation of water in my cabin, indicated that it came from some other source than the deck; on opening the store-room abaft the cabin, was exposed an appalling sight. It was discovered that the caps to the two rudder-heads had been driven up by the force of the sea, and the water was flowing from each opening in a circular jet. It was well that it was discovered in time, for had they been driven up altogether, they would have made two holes in the bottom of the vessel of nine inches in diameter; without other damage, this alone would have obliged us to go into port for repairs. We entered Ferrol.

During my official visit to the port authorities, I asked permission of the Captain-General, who was an Admiral of the Spanish Navy, to make all necessary repairs to the *Stonewall*. He, very courteously, granted my request. The work of repairing and coaling had been continued but a few days, when I was requested to call at the office of the Captain-General. Divining the reasons of the summons, I took, with me, my commission in the Confederate States Navy and my instructions. The Captain-General informed me, that he had been ordered by his Government, to inquire into and to report the character of the *Stonewall*, as to whether she was legitimately a man-of-war. The American Minister had demanded that she should be sent out of Ferrol, on the ground that she was a pirate, and not entitled to the hospitality of the port. It is to be regretted that the diplomatic representative of a great nation should have been so ignorant of international law bearing on this case, as to pronounce such a libel in his official correspondence. In diplomacy a blunder is considered almost a crime. The *Stonewall* was entitled to the same hospitality from the port as any other man-of-war.

The Captain-General, very kindly, assured me that he, personally, was satisfied as to the character of the *Stonewall*, but I must give such proof of that as required by the Government to answer the assertion of the American Minister in his official correspondence.

I handed my commission to the Captain-General, and holding up my instructions, I said, "You, sir, as an Admiral of the Spanish Navy, can fully appreciate the obligation I am under to permit no one to read my instructions." He looked over my commission, and returning it said, "This evidence is quite sufficient to satisfy my Government as to the character of the *Stonewall*."

Very shortly after this I received permission to continue the repairs of our little iron-clad. While repairs were in progress, two large men-of-war appeared off the port, the *Niagara*, one of the finest frigates of the U. S. Navy entered Ferrol; while her companion the *Sacramento* went into Corona, the Commodore commanding in chief, was on the *Niagara*. After a stay of a day or two the frigate followed the *Sacramento* and anchored in Corona, the entrances to the two ports being but a few miles distant one from the other.

I understood perfectly from this move, that the Commodore wished to avail himself of the right, under International law, of at once following the *Stonewall* when she went out from Ferrol. I was also fully aware that every movement of the *Stonewall* and her preparations for sea were daily and hourly telegraphed to the Commander at Corona. After repairs had been completed finally, for a trial trip had shown the *Stonewall* still leaky, all preparation was made on the vessel to meet the enemy. Spars were sent down, running rigging unrove in order that the screws might not be entangled. The quarter boats were sent on shore, for they somewhat interfered with the fire of the guns amidships. Forty tons of coal which had been put upon the steamer were sent off to lighten her draught so that her guns might be more effective. All the Government money on board was sent on shore, also the watches and letters of the officers to be forwarded to our families and friends.

I called on the Captain-General to take leave, and to thank him for all his kind courtesy. I told him that as the weather promised

to be fine, I should leave Ferrol the next morning. He said kindly, "If you wish to go out at night, your departure may not be immediately known to the enemy." I said, "The enemy is lying in wait for me at Corona, I must meet him somewhere on the ocean, and the present time is the most propitious for the weather is fine, and in rough weather the ports could not be opened and the guns of the *Stonewall* could not work." He said, "I think you are rash, you might go out at night without being seen, the fight will be too unequal; your small iron-clad against those two great ships!" I replied quietly, "I must meet the enemy, I will fight but I will never run away."

The following morning we left Ferrol followed by a Spanish frigate, her mission being to see that there was no violation of neutrality. The frigate fired a gun to notify me when beyond jurisdiction and remained out at no great distance for the purpose, I believe, of watching the fight. I went into my cabin, fell on my knees and offered up a prayer to the Almighty to defend the weak and the right, and to protect our families in their distant homes. I then went on deck, fully expecting immediately to meet the enemy.

The day was very fine, earth, sky and sea were alike beautiful, and nothing could be more lovely and picturesque than the mountains behind Ferrol and Corona, alive with human beings; the whole population of Ferrol, Corona and the neighboring villages and hamlets seemed to have gathered there to witness the battle of the little *Stonewall* and the two goliaths.

Dinner was served to the crew of the *Stonewall* at their guns on deck, for the *Niagara* and the *Sacramento* were in full sight with steam up and could come out of Corona and reach us in ten minutes, but they never left their anchorage.

From nine o'clock A. M. to nine o'clock P. M. I waited them, steaming up and down before the ports, but careful not to move within the legal line of three miles. The Spanish frigate remained out for some hours, and the crowd upon the hills only dispersed as night approached, making, I afterward heard by letters, many uncomplimentary remarks in reference to the inexplicable conduct of the commander of the *Niagara*. At nine P. M. I steamed off leaving the frigate *Niagara* and the *Sacramento* still at anchor in the

port of Corona. I had assured the Captain-General that I would not re-enter Ferrol, thus appearing to make that place a base of operation, as the *Niagara* and *Sacramento* appeared to wish to make of Corona. As I have before stated forty tons of coal had been sent on shore at Ferrol, and it was impossible to get across the Atlantic without another supply. So we made for Lisbon to fill up. While taking in a supply, the *Niagara* and the *Sacramento* came into port and anchored. This, again, was an extraordinary and inexplicable move, and satisfied me that they were watching the *Stonewall,* without wishing to fight. The weather was very fine and they could have waited outside, whereas by coming into port they must have been perfectly aware that they could not follow us out for twenty-four hours.

The port authorities were evidently very anxious, to get rid of the belligerents. An officer was sent to the *Stonewall* with the request that she complete coaling as quickly as possible. I said to him the sooner you hasten the delivery of coal, the sooner will we get off. I came for coal and shall not leave until I get a full supply.

The coaling was completed too late for the pilot to take us out that night. Early the next morning we steamed out to sea. We passed close to the *Niagara* and *Sacramento,* anchored in the lower part of the port; so close was the frigate *Niagara* that I observed the men at their guns and recognized my old friend the commodore on deck and saluted him, by lifting my cap. This was the last I saw of the *Niagara* and *Sacramento.*

EDITOR'S NOTE: The Commodore commanding the *Niagara* and *Sacramento* stated in his official report that: "The odds in her [the *Stonewall's*] favor were too great and too certain, in my humble judgment, to admit of the slightest hope of being able to inflict upon her even the most trifling injury, whereas if we had gone out, the *Niagara* would most undoubtedly have been easily and promptly destroyed. So thoroughly one-sided a combat I did not consider myself called upon to engage in."

It thus appears that there was considerable difference of opinion as to the actual fighting strength of the iron-clads of which the *Stonewall* was a type, and their fighting ability was undoubtedly considerably overestimated by their prospective antagonists. Much unfavorable criticism resulted. The entire history of the affair will be found in the Official Records of the Union and Confederate Navies in the War of the Rebellion, Series I, Volume 3, "Operations of the Cruisers, 1 April, 1864-30 December 1865," pages 461-470.

After leaving Lisbon I proceeded quietly on my way across the Atlantic, touching at Teneriffe for coal, for the *Stonewall* could not carry enough to enable us to reach home. From thence we stood for Nassau and there were refused the hospitality of the port, but we received outside sufficient coal to take us to Havana where hospitality was not withheld.

In my official visit to the authorities I told them I wished to coal and have made some slight repairs to the *Stonewall.* I was told I could remain as long as I thought proper, but at the same time I was earnestly requested, to prevent our men, if possible, from creating any disturbance ashore. I was glad to be able to assure them that our men bore an excellent character at Ferrol and I was sure there would be no complaint of their conduct at Havana.

I may say here, that during, the short period of my command of the *Stonewall* not a casualty and not a case of sickness occurred, and for this we owed much to the intelligent vigilance and attention of our medical staff, Dr. Green of Virginia and Dr. Muter of Georgia. Dr. Green afterwards went to Argentina where he practiced his profession with great success. In a few years he was able to retire and now resides in his native state.

A day or two after our arrival four or five Federal ships entered the port, looking out, I was told for the *Stonewall.* While at Ferrol and Lisbon, no restraint was put upon visitors to the *Stonewall,* though we were aware that spies abounded. Once in Havana a card was brought down from a Secretary of the U. S. Legation at Madrid. I said, "Bring him down, I will receive him." "He is gone, sir," said the man. "This card was left at the gangway, for the Captain; then the gentleman shoved off in his boat."

With all this publicity, it has always seemed to me very extraordinary that no official intelligence could have been transmitted to the U. S. or the different Atlantic stations where were Federal officers and ships, of the departure of the *Stonewall* from Lisbon, her last European port. At least I may presume so, for in crossing the Aalantic, approaching Bermudas, touching at Nassau and entering the port of Havana, never once did we sight a sail of the enemy: nor did one appear until we were anchored safely in Spanish waters.

I very soon received intelligence of the surrender of General Lee. I felt very gravely the difficulties of my position. No country to fight for and no flag to fight under! I must dispose of the *Stonewall*. While saddened and depressed at the news of Lee's surrender and most anxious for the future of the brave officers and men with me, I was rather amused to receive a *note* to "Dear Page," from an old naval acquaintance, then the captain of the U. S. frigate anchored near the *Stonewall*. The gentleman informed me of what I was not perhaps aware, he thought, the downfall of the Confederacy, and suggested that I deliver up to him the *Stonewall*. In answer, I thanked him for his information, but declined to act on his suggestion.

Through an influential Spanish friend, I proposed to the Captain-General to present the *Stonewall* through him, to Isabella, Queen of Spain. I told my friend that should my offer be refused, having no flag under which to sail, I would, with a few men willing to aid me, take the *Stonewall* out to deep water and in Spanish jurisdiction, I would cut every pipe in her leading outboard, and leave her to sink, which would be in less than an hour; but if followed and attacked by the enemy, I should fight her so long as a gun remained above water.

I must here state that in offering the *Stonewall* to Spain, I had made known the conditions under which, alone, I would make it. I felt it a sacred duty to send my officers and men to their homes, but we were utterly without money or credit, having sent all the ship's money to an agent on shore when we went out of Ferrol expecting to meet the enemy. Not foreseeing the fall of the Confederacy no provisions could be made to the crew. I informed my friend that the *Stonewall* had cost the Confederate Government four hundred thousand dollars. The books of the Paymaster showed that sixteen thousand dollars was due on the pay of officers and men. This sum, I must ask, to be advanced in giving up my ship. My friend urged me to ask for a much larger sum for my personal use. This proposition I promptly declined and told him all I asked was what was due to officers and men. The sixteen thousand dollars was paid and distributed by the Paymaster. I must here state that I had requested him in making his account to assign to each officer and man one month's additional pay.

Immediately after this transaction a Spanish admiral with several officers in attendance came off in finely equipped barge to receive the *Stonewall*. There was a delicacy in this proceeding on the part of the Admiral and officers that inspired me then, and even now as I recall it, with the deepest gratitude, as does the recollection of the hospitality and consideration shown us at both Ferrol and Havana by the authorities.

On this occasion the Admiral said to me: "Your executive officer can attend to this business, my barge is at the gangway, Captain ——— will accompany you to the Arsenal and then to your lodgings in the city."

At the Arsenal I found a fine carriage awaiting me, and still accompanied by Captain ——— of the Spanish Navy, I drove to the house of a lady who had invited me to be her guest so long as I remained at Havana. The same day came a polite note from the Impresario of the Colon, asking me to accept the key of a box at that theater during the whole of my stay in the city.

By decision of the Spanish Government, the *Stonewall* was delivered to the U. S. Government, and afterward sold by them to Japan for four hundred thousand dollars, and perhaps, as I was informed, for a little over that sum, and the sixteen thousand advanced for the crew of the *Stonewall* repaid to Spain.

Thus ended my career in the Confederate States' Navy.

My next move was to return to Europe where my family had resided during the war. I was asked at Havana if I would take back to England a blockade runner. I accepted the offer and reached England safely and delivered up the steamer to her owner, who remunerated me generously for this small service.

Some weeks later I sailed in company with two young sons for Buenos Ayres. The oldest of these two sons, not yet of age, had soon after the surrender of Lee, been liberated from the prison on Johnson's Island, Lake Erie. We have heard much of the suffering of prisoners at Libby Prison; should ever an impartial history be written of the Civil War, we may learn something of the suffering of Confederate prisoners. Philip, my third son, had received just before war was declared between the states an appointment for West Point. Under the circumstances, it was impossible for him to accept. He accompanied me to Richmond and was sent to the Military Academy of Virginia. When the buildings of the

Academy were burned by the enemy, every cadet capable of shouldering a musket joined General Breckenridge in the valley of Virginia and saw hard service. My son Philip was one of them, he was promoted and appointed aide-de-camp to General Corse with whom he was taken prisoner and sent to Johnson's Island, Lake Erie.

Thus I went to the Argentina to begin life anew.

During my five years exploration of that country for the U. S. Government I had made many friends, and had found climate and material resources exceptionally fine. I was not disappointed. I have not mentioned that after my return from my former expedition, a New York capitalist had offered me a large sum of money to return, take up land and establish on a large scale an estancia in which I was to have partnership. The offer was tempting, and I thought something of accepting it later. It was first, however, imperative duty to report and bring up my work for the Navy Department. Hardly was that completed when the Civil War put an end to all enterprise of this kind. So I returned to the Argentina without capital or profession, but my reception by many leading men of the country was most cordial. General Mitre, Ex-President, then as now, one of the most prominent men of the country said (taking both my hands) "You have done more for my country than any man living."

General Urquiza, Ex-President, to whom I had rendered some service while in command of the *Water-Witch* wrote to me offering me both land and capital to go and settle in his province, Entre Rios. I accepted it and for several years prosperity crowned my labors. I was able to repay, unasked, the considerable capital advanced me by General Urquiza, who was a very large landowner, and at that period considered the wealthiest man in the Argentina. He was assassinated during my residence near him by a political enemy, but some years after his death I repaid my whole debt to his heirs through his eldest son and executor. I may record, to show that there are generous hearts open to foreigners in all lands, that Urquiza's son, for himself and his family refused to receive a penny of interest, and yet interest in that country was, at that period, considered reasonable at twelve per cent, and my debt would have amounted to a considerable sum.

I may now at the age of eighty-seven say that I heartily rejoice in the reunion of our people under one flag the Stars and Stripes.

## Conclusion

As I have said before, the close of the war found me without home, country or career. The necessities of a large family obliged me to new and immediate exertion, and as to a land of promise I turned to the Argentina. A country I knew well, for had I not spent five years of my professional life in exploring it for the U. S. Government? We have all heard of the Pan-American conference in Washington and the idea of Mr. Blaine then Secretary of State, to secure the good will, sympathy and commerce of the South American states with our country. But over a quarter of a century previously many members of both houses of Congress the President, Fillmore, the Secretary of the Navy, Mr. Kennedy of Maryland, the Secretary of State, Mr. Edward Everett of Massachusetts were fully alive to the importance of friendship and trade of the republics of the south, and cordially united upon the sending of a naval party to explore the basin of La Plata both by land and water, study and report upon their capabilities for trade, natural resources, etc., and to conclude individually or severally, as the case might be, treaties of amity and commerce with our resident ministers.

I was selected to command the expedition, the U. S. Steamer *Water-Witch* being assigned me for the work. I was quite unaware of the double honor to be conferred upon me when I called, on a visit of leave, at the White House. Our President, Mr. Fillmore, received me very graciously and asked if I had seen Mr. Everett. I replied that I was then going to call at the State Department. "You will find," said that President, "That you go accredited with diplomatic powers, to conclude individually or severally with our resident ministers a treaty of commerce with Paraguay."

My first expedition had lasted over three years, and my report of it to the Government was translated in several foreign languages. It caused a tide of emigration to that beautiful country, and many intelligent men have assured me that it was a revelation. Few had dreamed of so fair a land yet open, with a Government holding out a hand of welcome to the stranger. During my second

expedition I met with several colonies from Australia and even from California who had after reading my book turned their faces to the Argentina, and had not regretted the change.

It was to that fair land I turned my face, when all semed dark and unpromising in my native land. What changes did I find? A well-organized Government, a Constitution very similar to that of the United States, a good class of immigrants daily arriving and a fair promise before the country of prosperity and peace, which, notwithstanding political strifes and financial difficulties can still hold her own, so wonderful and exhaustless are her resources.

I was not disappointed, my services were not forgotten, my reception by some of the leading men of the country was most flattering; may I not be excused from repeating the welcome given me by one of the most enlightened men of that country, and one who is still living and the leader of a strong political party, General Ex-President Mitre. Speaking and reading English perfectly General Mitre had read my book *La Plata* and my first report to the U. S. Government.

On my arrival with my two sons, my first visit at Buenos Aires was to the Ex-President. Taking both my hands he said, "Sir, you have done more for the advancement and progress of this country than any man living." I soon after received a letter from General ex-President Urquiza who without any solicitation on my part offered to me for a period of years an estancia five leagues square and well stocked with sheep. He also put at my disposal a considerable sum of money with which to begin operations, so I soon found myself established as estanciero on one of the finest properties of Entre Rios. The only condition being that at the end of a term of years named, I should repay him with half the net profits of estancia, but without interest.

My business as estanciero was very prosperous: at the end of a few years, having received a proposition from a commercial company to re-examine the Bermejo River I left estancia affairs in charge of my sons and accepted the offers made me by the Bermejo company.

In my explorations in the *Water-Witch,* I had ascended that important river for a certain distance, but now with a boat properly constructed for the purpose, I fully established its navigability for over eight hundred miles by small steamers suitably built, and I

now have the satisfaction of knowing that my labors have borne fruit. The two important rivers having their rise in the Andean provinces and connected with the outer world by flowing into the La Plata, at that time were vast territorial wildernesses in possession of savage tribes of Indians, now for nearly a thousand miles they are settled and owned by rich proprietors who have established agricultural colonies, well protected by small military stations of the Government. The Indians have been brought into a sort of semi-civilization and now seek employment on some of the large sugar and cotton plantations that have sprung up.

Foreseeing the greatness and prosperity of the Argentina, the largest of the South American Republics, and feeling a sincere interest in all that concerned it, I knew too well that its defenses against foreign invasion or aggression were utterly inadequate to meet any emergency, indeed it was open to the enemy who might at an unexpected moment show himself. At that time she possessed no ships that could legitimately be called "men-of-war." I proposed to the Government, in a system of naval defenses to construct two twin iron-clads and two sloops of war adapted to the interior waters, and an electric and percussion torpedo-system which had been successfully practiced in the Civil War in the United States.

My plans were accepted and I was sent to England to supervise the construction of the four vessels that I had proposed. In due time they were received and approved by the Argentine Ministry, and formed the nucleus of the young Navy. Several fine ships have since been constructed, armed and equipped upon the most approved models of Europe, and a fine well-organized naval school is in full operation under the charge of a distinguished corps of professors.

In short the Argentine Navy has grown with the country, and if well managed, promises to be all sufficient for defensive purposes and I think I may justly consider myself its founder. Moreover I, very naturally, feel an interest in its growth and good management, for three of my grandsons, bearing my name, born in the country, and therefore citizens, form a part of the personnel. One, only twenty-two, is Navigating-Lieutenant of one of their finest ships recently built and equipped in Europe; another has graduated from the Navy school number one in a large class, and

the youngest a mere child of twelve, was sent to England for a term of years by the Argentine Government to be trained as ship-builder and architect.

Thus it will be seen, that in spite of financial disasters and political strife, the Argentines are quite aware of the importance of possessing an efficient—if small—Navy.

While in England supervising the construction of these vessels, I heard of the assassination, by a political rival of my friend and neighbor General ex-President Urquiza. This was, in a business light, a disaster for me, for Urquiza, though really a very rich man, had many hungry creditors and bitter political enemies, so my fine estancia of five square leagues well-stocked with cattle and sheep, would I knew suffer, as I had neglected before my departure for England to secure it as intended by purchase.

The Argentine Government at that time owed, and still owes me, a considerable sum of money for services rendered, and for animals taken from my estancia in one of their revolutionary uprisings: but trusting to their justice and generosity to make right my claim, I left it in the hands of an agent.

Feeling old age and blindness creeping upon me, I was impatient to join my family in Italy where they had resided for many years.

From the Eternal city at the age of eighty-seven I give some incidents of a long life at the request of a relative.

Rome, January 4, 1895.

# DISCUSSION

## The Protection of Capital Ships Against Poison Gas

(See Page 1113, July, 1923, Proceedings)

Lieutenant Commander A. M. Charlton, U. S. Navy.—In considering the protection of machinery compartments against poison gas, Lieutenant Hains makes the rather fanciful suggestion that a system of inner compartments be provided in the engine rooms, motor rooms, etc. The gas-tight compartment in each space is to be provided with glass windows and have led to it all pipes, valves, switches and levers for the operation all the machinery is a manifest impossibility.

If Lieutenant Hains had had access to a machinery layout of an engine room on the airplane carriers, for instance, before making this suggestion, he would have seen that any idea of a central operating compartment for all the machinery is a manifest impossibility.

In a room one hundred sixteen feet long and thirty-seven feet wide are situated, among other things, two 45,000 H. P. turbo-alternators, each with two main condensers, main circulating pumps, air ejectors and condensate pumps, forced lubrication pumps and oil coolers; three 750 K. W. turbo-generators for excitation and ship's light and power, each with its own condenser circulating pump and vacuum apparatus, boiler feed pumps, fuel oil service pumps, fuel oil recirculating pumps and fuel oil heaters, cut-out valves for boiler, feed water, fuel oil and steam, hundreds of gauges and a switchboard with a multitude of switches. Even to contemplate the bringing together in one station the cut-out and change-over valves and switches for such a machinery plant is absurd on the face of it.

On an electric drive vessel, main turbo-alternators and main motors machinery must have air for cooling; and the boilers must be supplied with air for combustion purposes. All other air furnished to machinery compartments is supplied for the cooling of these spaces on account of heat radiation and to give a fresh supply of oxygen to the personnel.

If the necessity for the vast amounts of air required for cooling the main alternators and motors can be eliminated, all compartments except the boiler rooms may be sealed compartments, with devices installed for purifying and cooling the air and using it over and over. Oxygen may be released from tanks as the air becomes vitiated.

On the airplane carriers, the generators and motors will be fitted with a self-contained ventilating system. This apparatus will force air through the windings of the generators and motors where it will sustain a rise in temperature, due to the heat given off by the windings. The air will then pass through a cooler—a bank of tubes with sea water circulating through

it—and thence be turned to the motors and generators again to become heated. This system of air cooling eliminates the necessity for several large holes through the deck for ventilation purposes and materially improves the military efficiency of the vessels. This same type of cooling apparatus may be used for cooling the air in the remainder of the compartment. The boilers must have a continued supply of oxygen and so cannot be made air- and gas-tight. In these rooms the personnel must wear gas masks. This can be done without materially affecting their efficiency, for with oil-fired boilers the work of the fire room crew is not at all arduous. In this connection it may be of interest to note that Bureau of Engineering is now experimenting with devices which will enable the boilers to be operated without personnel in the firerooms. These devices include feed water regulators, high and low water alarms, fuel oil temperature regulators for the fireroom fuel oil heaters and distant control apparatus for turning on and off the boiler oil burners and the steam valves to the forced draft blowers. The successful development of this apparatus will permit the removal of all personnel from the firerooms or at least of all except one man to act in a supervisory capacity. This man can wear a gas mask without inconvenience or impairment of efficiency.

We thus make all machinery compartments, with the exception of the boiler rooms, of the fully closed type which is comparatively easy to protect.

Another phase of poison gas protection which has given the Department some concern is that against the effect of poison gas upon machinery, especially electrical apparatus. As mustard gas, phosgene, chlorine and other gases have a corrosive effect on metals and will disintegrate ordinary textiles, it has been brought up that these gases might destroy the insulating material on cables, motors and generators with a consequent derangement of their functions. Experiments seem to prove that we have nothing to fear from any concentration of gas which an enemy may be able to lay aboard one of our vessels.

## The Protection of Capital Ships Against Poison Gas

(See Page 1113, July, 1923, Proceedings)

Mr. Godfrey L. Cabot.—I have read with much interest the article by Lieutenant Paul W. Hains, "Protection Against Poison Gas."

I have given much thought to this question, both as a chemist and as an aviator in the United States Navy at the time of the World War, and I would like to make a few suggestions that I feel sure will receive the support of other chemists, both in the Navy and out of it.

The poison gases are practically all of them heavier than air and, therefore, particularly dangerous in case they should be dropped in the shape of large bombs upon a warship, for they would float downward and it would be a tedious, difficult and dangerous business to get rid of a large amount of poison gas that once got into a warship.

I recommend the carrying of a considerable amount of strong aqua ammonia. The crude aqua ammonia as delivered in carboys is entirely suitable for this purpose and this should be placed in such quarters in the warship as are most likely to be contaminated with poison gas dropped from above.

Water should, also, be at hand to dilute this aqua ammonia, because otherwise it might itself become a dangerous nuisance. Towels or other cloths drenched in aqua ammonia and hung up in places where the poison gas was found would speedily clear the atmosphere of the poison gas, as chlorine, phosgene or any other acrid gas is readily taken up by ammonia. It would be needful, of course, to have the cloths repeatedly drenched as fast as the ammonia in them was neutralized by the acrid gas and it would be prudent for the personnel to avoid the lower part of the room. If a man fell to the floor under such circumstances, his chance of survival would be pretty small. The top of the room would have more ammonia, which rises. The bottom would have more poison gas, which falls, but, of course, the process of diffusion would ultimately cause a uniform mixture throughout the room.

It seems probable that chlorine gas, due to its cheapness, its availability in practically unlimited quantity and its terrible corrosive properties, will be the gas most used in attacking vessels at anchor in navy yards, canals, rivers and all kinds of waterways connected with shipping, and it seems wise to consider the conditions that would then arise and the means of fighting such an attack.

Of course, first and foremost, the most important matter is superiority in the air, for bombing planes can be easily driven away by a superior force of pursuit planes or prevented from flying low enough to deliver their bombs with probability of hitting the mark, but suppose by reason of a fog or other circumstances, bombing planes carrying great quantities of chlorine gas bombs, were able to come down close to vessels or waterways containing a large number of vessels and drop large bombs containing each one or two tons of chlorine gas, with a small explosive charge to cause them to open up on impact; the liquefied chlorine gas thus set free would immediately part of it evaporate and if the quantity were very large, there would be a considerable residuum that by the evaporation of a portion would be chilled below the boiling point of chlorine gas, which is 33.6 Centigrade below the freezing point at atmospheric pressure.

This liquefied chlorine gas might flow down below and get into the lower parts of a warship, killing everybody that was exposed to its effect for any considerable time and speedily driving all the personnel that were not killed out of the ship. If the gas were allowed to remain long within the battleship, it would corrode all metal surfaces and organic tissues, paper, cloth and to a certain extent even wood. It would have to be fought with lime, with ammonia and with water and it would certainly be a very terrible thing if one or two tons of liquefied chlorine gas were dropped upon the deck of a battleship in such a way that a considerable portion of it flowed downward into the bowels of the ship.

It might not be amiss to have small portable engines containing aqua ammonia that could be thrown by hose into any place where chlorine gas was present. There are many other substances which will take up poison gas, such as caustic soda and caustic potash, but the great advantage of lime and ammonia over other alkalies for this purpose is that a surplus of the alkali is much less dangerous and annoying and, of course, in all such operations there would be a surplus of alkali in one place and a surplus of the acrid fumes in another.

Suppose, now, a number of large bombs containing chlorine gas were to strike into the River Thames or the Kiel Canal or some crowded navy yard or dock where there were a great number of vessels in a small space, here again you would have an immediate eruption of a great quantity of the gas and also a great quantity of the liquefied gas would immediately go to the bottom of the water where it would very speedily evaporate, bubble to the surface and increase the quantity of liquefied chloride gas lying near the surface of the water and corrode everything that was corrodible.

Here, again, it would seem to me that a machine for spraying ammonia or a thin paste of hydrate of lime and water such as obtained by slacking lime with a great surplus of water, would be the most effective way of fighting this evil and it would be essential that such spraying machines should emit a fine spray, particularly in the case of the emulsion of lime, for otherwise a good deal of the lime water would fall into the sea without slackening the equivalent amount of gas.

You will note that my thought is to supplement the admirable paper of Lieutenant Hains, which gives a very well thought out description of the means of protecting the personnel, by means for treating the problem as a whole, and, in particular, removing the excessively corrosive gases before they have done irreparable damage to ship and war materials.

Let us, lastly, consider the situation in the open sea. Here, of course, the vessel would immediately get in motion if attacked by poison gas and a means of dispersing the gas with an air blast from any point to which it had fallen as rapidly as it fell, might be very helpful, for the rapid motion over the water would disperse the gas if once it could be got away from the vessel and here, again, where the gas very likely would only be in the form of a screen, which means, of course, greatly diluted, cloths wet with some alkali such as ammonia or carbonate of soda, would be very effective in the confined spaces within the vessel. As far as the outside of the vessel was concerned, the chief remedy would be to run away from the gas as quickly as possible, while applying the personal protection so carefully described by Lieutenant Hains.

With regard to the suggestion of carrying tanks of oxygen, this is a reasonable proposition for submarines, but would be needlessly expensive for other vessels where an adequate supply of air is always within reach and can be blown in where needed with proper blowers.

The normal amount of carbon dioxide present in the atmosphere is four parts per 10,000. The limit beyond which carbon dioxide should not be

allowed to accumulate in theaters or lecture-rooms, is 16 parts per 10,000 and if this is exceeded there is an appreciable tendency to drowsiness on the part of those exposed. One half of one per cent may be permissible in a submarine, but is a far greater portion of carbonic acid gas than should be permitted in the living quarters of a warship.

## Common Sense Training With the Service Pistol

(See Page 1309, August, 1923, PROCEEDINGS)

LIEUTENANT COMMANDER E. E. WILSON, U. S. NAVY.—The interesting and instructive article by Comdr. Baum is a direct challenge to standard methods of training that no old timer in the shooting game can allow to pass unanswered. As a member of the board which compiled "Small Arms Firing Regulations 1923" I feel it my responsibility to clear up some of the impressions which may be obtained from this paper.

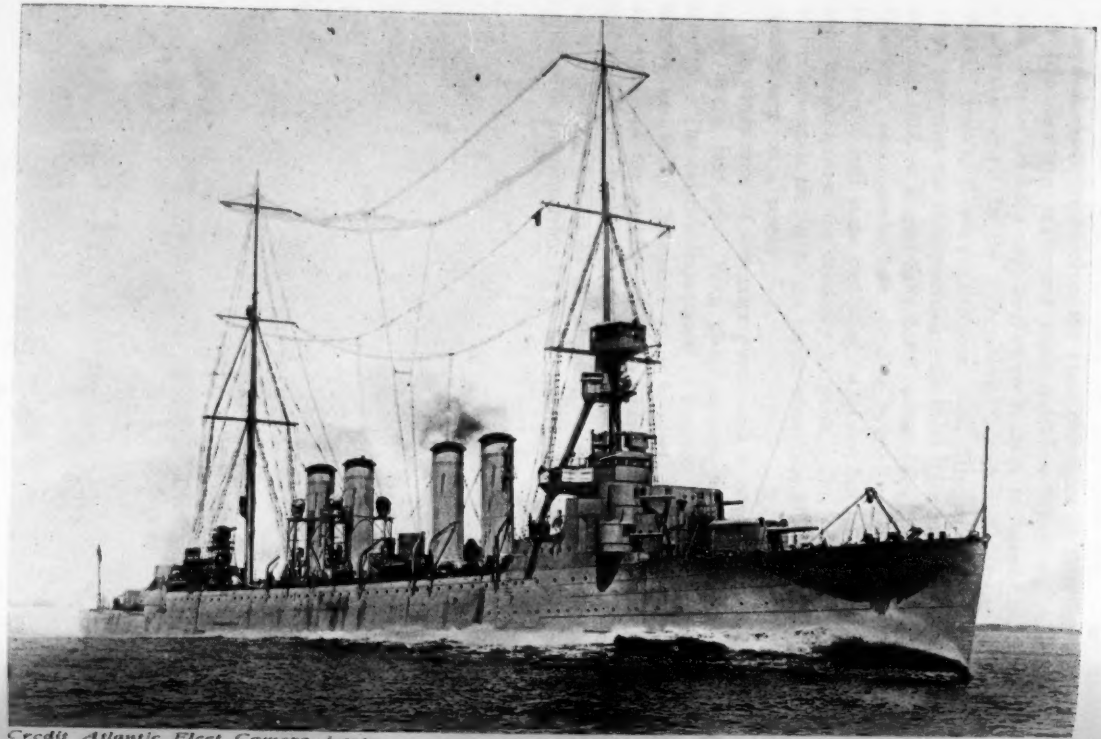
The cry for "service conditions" shooting is one that arises periodically, and periodically dies. Plausible at first blush, it is ultimately proven to be unsound. One must learn the fundamentals before he undertakes the advanced practices and "service firing" is certainly advanced firing. In great guns we don't go to Division Practice until we have qualified at Short Range Battle Practice. No more should we go to "Pootung" until we have been to Guantanamo. The trouble now is we lack even the time for the fundamentals.

A sharp line must be drawn between target shooting and firing under service conditions. One of the troubles in the shooting game is the desire to combine the two. The incentive of target shooting is the competitive feature. The moment the element of chance is injected, as it always is when we attempt to simulate service conditions, then the competitive feature is lost and interest lags. The history of the National Rifle Matches is replete with the failures of novel matches because they were dependent more upon luck than skill. The fundamentals must be taught by straight out and out "artificial" target firing. Once this is done further training should be had, and the novel ideas described in the paper under discussion are an excellent example of the methods to be used. The board for revising the Small Arms Firing Regulations recognized this when it made the requirements for marksman and sharpshooter straight target firing and those for expert riflemen, an adaptation of target firing to service conditions. In the expert's course, the "slow fire" work is intended to simulate sniping; the "skirmish," the normal attack, and "surprise fire," the situation of a sentry whose beat is suddenly crossed by an enemy.

The "squeeze" which is the very basic principle of all shooting, comes in for ridicule in this paper. Important as the squeeze is in rifle fire, it is even more so in pistol fire. The "let-off" is everything. The paper gives the impression that the squeeze is a slow process. Nothing could be further from the truth. One can fire five well aimed shots in eight seconds with the old service revolver, single-action and squeeze every

shot. There are three kinds of squeeze, slow, quick and quicker. The Small Arms Firing Regulations recognized this and required three speeds for qualification: slow fire, timed fire and rapid fire. They distinctly state that rapid fire involves the same principles as slow fire except that all functions are performed more quickly. When an expert takes a long time to get off a shot he does so in order to insure exact aiming, not exact squeezing. In the International Match last year at Milan, Italy, Walter Stokes, World's Champion, took fifty minutes to the last two shots and won the championship with them. He probably wouldn't waste so much time in a gun fight but I would back him any time against a "Pootung" shooter who had not first learned to squeeze. Any one can point a pistol just as he can point his finger, but he can't shoot the pistol until he overcomes the tendency to yank. This requires much training in fundamentals on the target range where the effect of the yank can be readily seen on a target.

The comparison of a service pistol with a sawed-off shot gun is certainly not a fair one. With pistol against pistol, however, things are different. The relative importance of accuracy and rapidity is laid down in great gun firing. The score varies inversely as the time and directly as the square of the number of hits. This is a rational rule and applies just as well to pistols. Accuracy is a result of fundamental training and so is rapidity. Let us by all means have more training along the lines indicated in this paper but let us first qualify, at least, in the fundamentals.



Credit Atlantic Fleet Camera Party

# PROFESSIONAL NOTES

PREPARED BY

LIEUTENANT COMMANDER R. F. FRELLSEN, U. S. NAVY

AND

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## GENERAL ARRANGEMENT

VESSELS BUILDING, NAVAL POLICY, MATÉRIEL, PERSONNEL
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## GREAT BRITAIN

CAN THE EMPIRE BE MADE SAFE?—Every one of these questions (involving the safety of the British Empire) resolves itself at last into a problem of communications. The British Empire is in no respect more dissimilar from any other empire which has ever existed than in this respect. If at the time of the creation the greater part of the earth's surface had not been flooded with water, there could today be no British Empire. In spite of all the advances in railway construction and railway operation, the British Empire is incurably maritime. In the early stages of its evolution its several parts were divided by the seas which, though as a matter of convenience they bear distinctive names, are in fact all one. Owing to the development of the marine steam-engine the seas now unite the British Empire, and, during the past half a century the enormous distances which separate the Mother Country from the younger nations, as well as from the Crown Colonies and Dependencies, have been steadily contracted in point of time. Simultaneously remarkable progress has been made in promoting the comfort of travel by sea, and that movement, which is still going on, is not without its social significance, for man is a gregarious animal and hates to live in isolation, particularly if he has left the land of his birth. There is no hope, indeed, for the British Empire unless we concentrate attention upon its maritime character, realizing all that the great sea highways represent, politically, economically, and defensively.

Credit Atlantic Fleet Camera Party

The conquest of the air, whatever the future may hold—and we dare not ignore the possibilities which it holds—has detracted little from the importance of the sea to the British people. There is one fundamental difference between the ship of the sea of our experience and the ship of the air of some men's fancy. In the former, passengers and goods are accommodated; the ship is merely the container of the weight which is in fact water-borne, powerful engines moving the burden from place to place. The ship of the air must always suffer under one disadvantage, which applies equally to the aeroplane, with which we are more familiar. The airship or the aeroplane must not only be the propulsive agent, but it must also support its own weight and the weight of its cargo. The relative density of sea water and air can be judged by the most simple tests carried out by any child, and yet controversy as to the relative advantages of sea carriage and air carriage continues, those who participate in it remaining largely blind to the permanent disability of the air. The airship and the aeroplane may be pressed into the service of the British peoples in order to quicken passenger travel, but, to the limit of vision, neither the one nor the other will be able to carry great weights, and *of all the problems which the Empire presents none is more important than how best to carry weights, whether they be tens of thousands of passengers, cargoes of goods, or masses of armaments, from one distant point to another.* There is talk of inter-Imperial trade and Imperial co-operation for the purposes of defense, but every consideration at last resolves itself into the simple proposition of carrying weights at an economic speed from place to place. And in that respect the air compares unfavorably with the land, and even more unfavorably with the sea. For sea transport is the cheapest of all transports, whether the purpose be peace or war. The ship of commerce carries its thousand, two thousand, or three thousand passengers, or even heavier cargoes of goods, at a price with which neither the railway, the airship, nor the aeroplane can hope to compete successfully.

When the issue is not trade, but war, the problem is much the same, and for a given cost the battleship, which is merely a platform for heavy guns, well protected, remains the most effective as well as the most economical instrument of offense and defense, having light cruisers, destroyers, and submarines associate with it to perform their special functions. That is the conclusion, inevitable on all the evidence, which has been reached after the most careful investigation by every nation without exception. If the conclusion were otherwise, the idea of holding simultaneously this autumn an Imperial Conference and an Economic Conference might as well be abandoned. For if air power has rendered the battleship obsolete, it would also have to be conceded that it has dealt a vital blow at the ship of commerce. The ship of commerce is not constructed for a contest of violence, and the force which could destroy a battleship, with its elaborate defensive system, could far more easily destroy a ship of commerce. And the apothesis of air power could offer us nothing in place of the ship of commerce, though it might lead to the evolution of airships or aeroplanes which would provide us with a measure of defense. But should we want that measure of defense, we who live huddled together to the number of upwards of forty millions, in the British Isles, exchanging the surplus products of our factories and workshops for the surplus food of nations overseas? If the battleship is doomed, the ship of commerce is also doomed, and how in those circumstances could we obtain the tens of millions of tons of raw materials and food which are necessary for our existence?

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There is something very like an organized conspiracy to depreciate the value of the British Fleet and to condemn whatever the Admiralty,

responsible for the maintenance of that fleet, says or does; and by a coincidence, if it be a coincidence, the depreciators of the fleet and the critics of the Admiralty are all united, whether they be found in the House of Lords or the House of Commons or in the Press or on the platform, in preaching one doctrine—that air power has rendered sea power more or less obsolete. That doctrine, as has been suggested, involves not merely the extinction of the Royal Navy but the extinction also of the British mercantile marine, and we are offered nothing in place of one or the other which can be regarded as satisfactory, for the aeroplane has a very short range and the airship is still a thing of the future; both are indeed in the experimental stage. Is there an organized conspiracy? It would be difficult to answer that question, but it is at least remarkable that at every turn enthusiasts arise who proclaim that the present, as well as the future, lies with air power, and that those enthusiasts are to be found in considerable numbers only in this country, *which lives on and by the sea, and can never live on and by the air.*

An agitation arose soon after the conclusion of the Great War in favor of scrapping the fleet entirely. The outcry fined itself down, after a time, to the cry that, though cruisers, destroyers, and submarines might have some use, the battleship was dead. At the Washington Conference the Two-Power Standard—which applies only to battleships—was abandoned in the eyes of the world, and we agree that we would be satisfied in future with a battle fleet of equal strength to that of the United States, Japan, France and Italy accepting lower ratios. That agreement involved the construction by this country of two capital ships, each of 35,000 tons displacement. All the clauses in the Washington agreement, which represented a degradation of our naval prestige and power, were accepted by the disciples of air power joyfully; but when it was proposed to carry out those clauses of the agreement which involved the building of the two capital ships, outcry was once more raised. The future, we were told, lay with the aeroplane and not with the battleship, though at Washington the great maritime Powers had fought for many weeks, not over any proposal to abolish battleships, but, realizing their value, on the number of battleships which each country might possess. Without those two capital ships the fighting weight of the British Fleet would in no short time have been inferior to that of the Japanese Fleet. But what did that matter to the peoples of the Dominions, washed by the waters of the Pacific, so long as we in these islands had aeroplanes and talked of airships? Later on the Admiralty submitted to Parliament proposals for developing Singapore as a naval base, linking the Royal Navy of the Old World with the Royal Navies of the New World. Again outcry was raised. The critics were much the same as before, and they proclaimed that the scheme was a preposterous one and that the money which it was proposed to sink in the "mud swamps of Singapore" could be spent to much greater advantage on air power for the defense of London. What did it matter to us if the peoples of Australia and New Zealand must remain without protection in an emergency, so long as we made London safe from air raids? In the imagination of these champions of air power, the fleet was useless, and therefore why develop a new naval base? It was true that the peoples of the Overseas Dominions were building navies on the familiar lines and proposed to go on expanding them, but therein they were merely exhibiting their lack of knowledge and want of vision. The battleship was already obsolete; in no long time cruisers, destroyers and submarines would go the same way; and it was our business to adjust ourselves to the new revelation and leave the Dominions to pay the heavy price of their error in continuing to have faith in sea power.

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In the development of Singapore we are brought face to face with two problems. In the first place, Is the battleship obsolete, because, if it is, it would be difficult to justify the large expenditure on the new base? Expert inquiry has been carried out in this country as well as elsewhere, and, with a unanimity which is not remarkable in face of the evidence, the findings have always been the same. The conclusions have been recited in *The Fortnightly Review* on former occasions. But the question has again been investigated in the United States, which has evidently felt the reaction of the agitation conducted so energetically in our own country. The matter has recently been considered by the Navy Board at Washington. It has been announced that this body has reached the conclusion that "The development of aviation as a vital *branch* of the Service cannot be pushed too strongly, but, at the same time, the surface fleet must be rounded out to the five-five-three ratio (that is equality with the British and superiority over the Japanese Battle Fleet) provided for by the Naval Treaty." The Secretary of the United States Navy Department has summed up succinctly the findings of the Navy Board.

"The line-of-battle ship, whether the seventy-four of early days or the 33,000-ton, 16-inch gun battleship of today, has always been, and still is, the main reliance of fighting fleets. Enthusiasts for each new weapon of sea warfare predict that the heavy-armored, heavy-gunned ship is doomed by that particular weapon. It was so with the submarine, but nobody now claims that the submarine made the battleship obsolete. It is so now with the airplane—but the battleship still is the strongest element in the nation's sea defense, and will be as long as most of us now living are concerned with mundane affairs.

"We must keep our sense of proportion. If the battleship is obsolete because of the weapon of the air, so, of course, most certainly are other ships less powerful than the battleship also obsolete. Accepting that premise, floating navies are about to become extinct.

"The premise and the conclusion cannot be accepted. The tremendous importance of the new weapon, the airplane, is clear. Every effort is being made to develop it and to make it as effective as possible for offense and defense. The place of the airplane in armies and navies is assured and vital, but the ships that float upon the sea are still the nation's strongest sea power."

Another résumé of the general findings of the Navy Board has been prepared by Mr. Roosevelt, the Assistant Secretary of the Navy Department. After presenting a digest of the facts brought out in the course of the inquiry, he has recorded:

"One group tends to discount the airplane's value. This, of course, is wrong. The airplane is a great and necessary development and will have far-reaching effects in military science. It must be developed, carefully developed, and the department is bending every effort to this end.

"The other group contains those who hold that the airplane is the all-important naval weapon and that it has rendered the battleship obsolete. This doctrine is the more dangerous, for at this time it makes a really popular appeal. It strikes the imagination, for the air service is romantic, and it can be argued on the basis of economy.

"Any course of action that would eliminate the battleship would be a national disaster.

"The battleship in the navy corresponds to the infantry in the army. There is an old saying, variously attributed to Napoleon and other great leaders, which says in effect: 'The infantry is the army. When the infantry is defeated, the army is defeated. When the infantry is victorious, the army is victorious. All other branches are but auxiliary arms.' Substitute 'battleship' for 'infantry' and 'fleet' for 'army' and the same holds true.

"We must ceaselessly reach for the new ideas and improvements along every line. If we do not, our navy will fossilize. We must bend every effort to development of the air service. But we must not be carried away by dreams; we must not mistake fancy for fact. The battleship remains at present the backbone of forces afloat. The fleet will be helpless without its auxiliary arms, but it is the guns of the great ship that will hammer out victory when the fate of the nation hangs in the balance."

It is due neither to collaboration nor coincidence that the views expressed by the Navy Board of the United States coincide very closely with those expressed by the Committee of Imperial Defense on our side of the Atlantic. The United States has no independent air force, as it is recognized that air power is essentially an extension of sea power, to be used for reconnaissance, gun-spotting and other purposes, as well as an extension of the power of the army. The aviation experts of the American Fleet had ample opportunities of presenting their case for the aeroplane and airship, and it was only after listening and giving due weight to this evidence that the Navy Board reached conclusions corresponding very closely with the conclusions reached by successive Boards of Admiralty in this country, and confirmed by the Committee of Imperial Defense. It may be that the aviation enthusiasts in the United States were somewhat at a disadvantage, in that they possessed no propagandist machinery for collating and co-ordinating all the facts and fancies which occupy the active minds of the champions of air power in this country. But, nevertheless, the case for the air by no means went by default, but tended rather to confirm the highest expert opinion in the United States that air power is not a substitute for, but an extension of, sea power.

That is the conclusion which has apparently dominated responsible naval opinion in this country, and explains the claim which has been put forward that, if the Navy is to be in a condition to fight, it must possess and control its own air arm. This issue has, either intentionally or otherwise, been confused, and it has even been suggested that the Admiralty has been endeavoring, in association with the War Office, to abolish the Ministry of Air and to extinguish the Royal Air Force as an independent service, incorporating the *personnel* and material in the Navy and Army. There is, of course, no shadow of foundation for such statements. The Air Ministry, the counterpart of which is to be found in no other country, is the child of Parliament. The House of Commons, with the support of the House of Lords, was led by a small group of enthusiasts to divorce air power from the Navy and the Army. The proposal was stoutly opposed by the responsible leaders in the two senior services, but the politicians triumphed. It is not the habit of naval and military officers to oppose the decisions of Parliament, for Parliament exists to govern, whether they be wise or foolish. In this instance, neither the Admiralty nor the War Office has attempted to undermine the Ministry of the Air or rob the Royal Air Force of its independence. All that the Admiralty has sought is the training and control of the relatively small number of pilots and machines which are required by the fleet if it is to fulfill its mission. Airplane carriers are passing into commission, and it is to incur serious risks to our sea power if, while the ships themselves form an integral part of the fleet, the aeroplanes and their pilots represent another body necessarily ignorant of the sea and of the peculiar conditions which govern naval warfare.

It is in the light of these considerations that the Imperial Conference is about to assemble in London. That the representatives of the Dominions will unanimously support the Home Government in its decision that a navy is still essential—capital ships, light cruisers, destroyers and submarines—is beyond question. But the naval situation has undergone a radical change since the last Imperial Conference assembled. At that time

the Two-Power Standard still operated, and that standard took no account of any ships, large or small, which the Dominions maintained at their own expense. Under the Naval Treaty at Washington, the Dominions accepted the one-power capital ship standard as an Empire standard. It should hardly be necessary to add that while tonnage ratios were applied to capital ships other tonnage ratios were applied to aircraft carriers, and that the limitations on the displacement of light cruisers and their armament are also Imperial. The Dominions, through their representatives, are bound by this Treaty exactly as this island country is bound by it. Canada, Australia, New Zealand and South Africa, each and severally, accepted this new standard of strength, as also did India. The significance of that agreement is not to be ignored. Its implications are all-embracing, so far as the British Empire is concerned. Whereas in the past the United Kingdom maintained a two-power standard fleet, and any naval preparations made by the Dominions were regarded as over and above that standard, now the Mother Country and the Dominions are committed to a one-power standard as an all-Empire formula. When the two capital ships which are now building have been launched, no other vessels of that type can be laid down until 1931, either in this or any other country within the communion of the British nations. They are, on the other hand, free to build as many cruisers, destroyers and submarines as they may desire, and to keep those vessels either in full commission or with reduced crews.

It is thus apparent that the freedom of action of the Imperial Conference when it comes to deal with the problems of naval defense, will be considerably circumscribed. It will no longer be possible for any Dominion to decide to build one or more capital ships, although neither Canada, Australia, New Zealand nor South Africa possesses a single unit of this type. The battle fleet provided by the taxpayers of the Mother Country, when strengthened by the two vessels now building, must remain until about 1934—the third year after any keel can be laid—the battle fleet of the whole Empire—it is only in regard to cruisers, destroyers and submarines that expansion is possible. In these circumstances, the conception of an Imperial Service Squadron of capital ships, provided by the Mother Country and the Dominions in accordance with some co-operative arrangement, is dead. All that can be done must be in the direction of smaller craft—light cruisers, not exceeding 10,000 tons, or armed with guns of larger caliber than eight inches, and destroyers and submarines.

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In knowledge of these considerations, the importance of Singapore must be apparent. For, *at present, the one battle fleet of the Empire could not be maintained on service in the Pacific.* Whatever danger might threaten the far-distant Dominions in that ocean, the British battle fleet could not proceed to their assistance. Is that a small matter at a moment when, irrespective of party divisions, men of vision are realizing increasingly that if the Empire is to persist, if migration is to continue, and if development of the waste lands is to be promoted, the Empire must be made safe? These considerations must have been in the minds of the Sea Lords for many years; and in 1920 the proposal to develop Singapore was considered by the Committee of Imperial Defense and recommended to the Cabinet for approval. That approval was not withheld. That decision by the Committee of Imperial Defense was peculiarly significant, because that body includes representatives not only of the Navy and the Army, but of the Air Force, as well as of the Colonial and India Offices and the Treasury. When Mr. Bonar Law's Government subsequently came into office, the question was again remitted to the Committee of Imperial Defense, and it again urged that the scheme was one which the Cabinet should accept. It was in these circumstances that a sum of £200,000 was

provided in the current year's Navy Estimates for beginning the work at Singapore; and it was only later on that critics appeared in the field urging that the money which it was proposed to spend in order that the unity of the seas might be preserved for the one battle fleet of the Empire should be diverted to an expansion of air-power for the defense of London. London must be defended against any possibility of successful raids, but it would be an act of madness to sacrifice the fleet in order to render London safe, even though London be the capital of the Empire. The two proposals are not in opposition, but are complementary the one to the other.

Since the project of developing Singapore was first considered—and its inception dates back to the time of Lord Fisher—the center of naval gravity has shifted. The German Fleet, defeated, has sunk in the waters of Scapa Flow, and we are resuming our traditional naval policy. The Mediterranean is becoming once more the naval pivot of the whole Empire, as it was before the German menace in the North Sea began to take shape. The movement of squadrons from northern waters to southern waters has already begun, and the time is at hand when the Main Fleet of the Empire will be held on the leash in the Mediterranean, ready to go anywhere and to do anything—provided it has suitably distributed places of supply and repair at its command.

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It has been claimed that the development of Singapore as a naval base offends against the spirit, if not the letter, of the Washington Naval Treaty. If that suggestion rested on any foundation, the proposal would, as a matter of honor to the other Powers represented at Washington, have to be reconsidered. But the claim that by developing Singapore this country is dishonoring its pledged word has been heard nowhere save in the House of Commons, where there are many friends of every country but our own. The fact, however, is that the proposal to develop Singapore was common knowledge among the delegates at the Washington Conference, and the self-denying ordinance with reference to the provision of bases in the Pacific Ocean was carefully drawn up so as to leave this country free to convert Singapore into a first-class naval base.

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These are the factors in the naval situation which the Imperial Conference must take into cognizance when it approaches the problem of naval defense. Its aim must be to try and answer the question: Can the British Empire be rendered safe? If it had to admit that docks, repair facilities, and stores of oil fuel could not be provided at Singapore, it would have to answer in the negative. Singapore emerges as the essential link in the naval defense of the Empire, knitting into one indivisible force in time of emergency the young navies of the Dominions with the old navy of ancient and high prestige of the Mother Country. On Singapore the defense of British interests in the Pacific will hinge in coming years. While that is true when war threatens, it is also true when there is no shadow of war on the horizon; Singapore is necessary for the maintenance in peace of the prestige of the British people, a political as well as an economic asset. If Singapore were not developed, the one battle fleet of the British peoples would be permanently shut out of the Pacific; we should be slamming, barring and bolting the door in the face of our partner nations overseas. As the writer has already suggested elsewhere, this base is essential for the free mobility of the British Fleet, which must be restored in the new conditions which have been disclosed owing to the increase in the size of ships of all classes, and in particular the necessity of giving capital ships "bulges" against torpedo attack. It may seem to laymen that the introduction of the "bulge" is a small matter, but, in fact,

by greatly increasing the beam of a ship difficulties have arisen which the development of Singapore will remove. It may also appear a matter of little importance that the Navy, which used coal, widely distributed, is now dependent upon oil. But there again a new problem has been created, and that is why the Admiralty are providing at this moment additional storage tanks on the route to the East—Malta, Aden, Ceylon, Rangoon, and Singapore.

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When the Imperial Conference of 1909 met in London, the Admiralty submitted a memorandum in which the following sentences appeared:

"If the problem of Imperial naval defense were considered merely as a problem of naval strategy, it would be found that the greatest output of strength for a given expenditure is obtained by the maintenance of a single navy with the concomitant unity of training and unity of command. In furtherance, then, of the simple strategical ideal the maximum of power would be gained if all parts of the Empire contributed according to their needs and resources to the maintenance of the British Navy."

That doctrine of pure strategy can no longer be supported. For good or for ill, it has been necessary to abandon it in view of the action taken by the Dominions in laying the foundations of small navies of their own. It is apparent that these small forces, though they are relatively weak at present—leaving the Mother Country still to bear the main burden of naval defense—are destined to grow. The immediate aim must be to find a means of associating these little navies with the great navy supported by the Mother Country. That involves some scheme under which there will be a measure of interchangeability of ships as well as crews, and it also involves the maintenance of the fullest mobility, which is a matter of bases. Our eyes must be fixed on the conception of an oceanic navy, representing all the peoples of the Empire and dedicated to their common defense. We have had to abandon the old ideal of one fleet for the one Empire under one Imperial Naval Board; but the same end may be obtained, though at greater cost of labor and of money, by the road which the Dominions, by the foundations of navies of their own, have chosen to follow.

As we preached the doctrine of unity of the seas when we were concentrating all available forces in the North Sea—reminding the far-flung Dominions that in those waters their interests would be defended—so, now that the Main Fleet is passing back into the Mediterranean, we must continue to pay allegiance to the same principle, adjusting our policy to the policy of the Dominions in order to obtain their support. We must abandon the heresies which gained currency while the German menace was growing at our very doors. We must no longer look upon the navy, as the First Lord has protested, as mainly concerned with the direct defense of our coasts by standing between us and a Continental navy.

"The Navy was bound in the future, as in the past, to become an ocean-wide Navy. What mattered to us was not the defense of the waters immediately round our shores. The real Imperial task of the Navy was the great task of keeping free the seas of the world for our commerce and for the free intercourse and the mutual support of the Empire. Just as it was the forces of the Empire, and not the forces of the United Kingdom alone, that won the war, so it was to the strength of the Empire and of the forces of the Empire that we must look to secure the peace.

"The tasks that lie ahead in the defense of this Empire," continued Mr. Amery, "are far too great in the future for this little country alone to sustain them. We are sustaining them meanwhile. We are shouldering a tremendous burden, but we cannot shoulder that burden unaided forever."

Only by holding fast to our sea power and enlisting the fullest measure

of co-operation on the part of the Dominions can we hope to make the Empire safe. Whatever may be the future of aviation, the seas will remain the great highways of the British peoples, and we must make them secure in war as in peace. It is over those routes that our trade and the trade of the Dominions must pass, and it is over those routes also that in the hour of danger troops would have to be transported. The skies are clear; and it is in the years of tranquillity which, we trust, lie before us that the peoples of the British Empire must, in unity of purpose, lay the foundations of their security and prosperity, recognizing that all the problems of trade, settlement, and defense are in reality one composite problem to be solved only by methods of compromise, pursued in a sympathetic atmosphere, and in full recognition of the importance of sea power to a maritime Empire.—Archibald Hurd in *Fortnightly Review*, July, 1923.

INCEPTION OF THE SINGAPORE PLAN.—There is every prospect that the forthcoming Conference may inaugurate a new era in Empire defense policy. It is not without significance that the first really important naval decision to be taken since the war should concern the development of a fleet base intended mainly for the protection of oversea Dominions. Contrary to what some of the critics allege, the Singapore scheme did not originate entirely with the British Admiralty. In the course of discussions at the last Conference both Australia and New Zealand strongly urged the provision of such local facilities as would enable the most powerful ships of the Royal Navy to operate in the Pacific Ocean if ever the need arose. The Admiralty were compelled to point out that under existing circumstances the battle fleet could not be sent to the Pacific on account of the absence of any docking base for the heaviest ships.

The question of creating a new base was then discussed, and the choice of a site seemed likely to fall on a certain harbor in New Guinea. A final decision was postponed, however, till the outcome of the Washington Conference became known. Eventually Singapore was chosen, financial reasons having a good deal to do with the selection, for it was found that the existing base at this island could be enlarged to suit modern requirements at a much smaller expenditure than would be necessary in the case of an entirely undeveloped harbor. Australia and New Zealand were doubtful at first whether Singapore was sufficiently near their coasts for ships operating therefrom to extend adequate protection, but as Admiralty staff officers were able to reassure them on this point, both Dominions warmly supported the plan. That, we believe, is the true history of the Singapore scheme. The question of financing it has certainly not been overlooked. It will probably be found that the two Dominions are prepared to contribute up to their full capacity.—*Naval and Military Record*, 1 August, 1923.

SINGAPORE AND WASHINGTON.—But the most serious opposition to the Singapore scheme does not come either from the economists or the anti-battleship partisans. It represents a protest against a measure which is held to be prejudicial to the cause of peace by disarmament and as threatening to undo the work of the Washington Conference. Erroneous though we believe this view to be, it is undoubtedly shared by many thoughtful persons who cannot be suspected of little-Navy tendencies. Their argument is that while the other Powers concerned are loyally observing both the letter and the spirit of the Naval Treaty, this country alone proposes to embark on an enterprise which would run counter to the aim and intention of that compact. Singapore, it is true, lies outside the zone in which new naval strongholds are forbidden, but it is sufficiently near to be con-

sidered strategically part of the same area, and its avowed purpose is to enable warships to operate in the very ocean where the Washington agreement sought to restrict armaments to a minimum. Hence the strong disapproval which has been manifested in quarters where suggestions for safeguarding the Empire are ordinarily received with sympathy. But at the bottom of everything lies the hard fact that unless Singapore is developed we shall not be in a position to deploy our naval power in the Pacific. That may not seem a very serious matter at the present moment, when we are on terms of friendship with the only countries that could injure us there; but the completion of Singapore is to be deferred till 1933, and who shall say that the political situation in the Far East is immune from change of any kind during the next ten years or more? Human nature being what it is, dependence on the good will of a foreign Power necessarily implies acquiescence in everything which that Power sees fit to do. The expansion of the Air Force proves that we are not prepared to accept such a humiliating rôle in Europe, and there are equally good reasons for rejecting it elsewhere.—*Naval and Military Record*, 1 August, 1923.

BRITAIN'S CHECK ON JAPAN.—"The only justification for the Singapore naval base is the possibility, however remote, of war with Japan," declared Viscount Grey in the House of Lords in answer to a question whether the new naval base was aimed at Japan or at the United States. The subject came up in a debate on expenditure for Britain's Air Force and her Navy, we learn from the press, which quote Lord Grey as having said that "essential as this expenditure is, it is the beginning of a new competition which will inevitably lead to another war, worse than the last, and from which European civilization will not recover." Lord Grey became more explicit when he added that "if such a war did occur, it would be a race conflict, in which the United States and the British Empire would be engaged on the same side." Meanwhile he urged the Government to take all possible steps for the international limitation of armaments, and gave it as his opinion that limitation can be effected "only through the League of Nations."

An indication of the official Japanese attitude is afforded in Tokyo press dispatches which report Count Uchida, Japan's Foreign Minister, as saying that the British plan can be justified in view of the abrogation of the Anglo-Japanese Alliance; yet he states in an interview that the plan conflicts in many ways with the spirit of the Washington Treaty. Nevertheless, he says, Japan regards it as a British affair in which she can not interfere. Count Uchida is quoted also as saying that no Anglo-Japanese situation calls for such an extensive undertaking as the Singapore base, though he points out that the agitation against it was started by British statesmen, like Lord Grey, and not by the Japanese. Admiral Takarabe, Minister of the Japanese Navy, is cited in these Tokyo dispatches as saying that Great Britain favored the project before the Washington Conference was opened and that the naval experts of the Powers concerned were cognizant of the existence of the plan. According to this Japanese admiral, Japan must now look to her national defense, because Singapore is only two days' steaming from Formosa.

In the House of Commons, we learn from London press dispatches, it was charged, in a combined Liberal and Labor attack on the project, that the Singapore naval base violates the spirit of the Washington treaties, and also will inaugurate a new race of armaments. These disptches relate also:

"An effort to pass a vote of disapproval was defeated, 217 to 130, following a defense by Mr. Amery, First Lord of the Admiralty. He denied

the suggestion by George Lambert, Liberal for Devonshire, that the Singapore base was a threat against Japan, and said that Singapore was outside of the zone defined in the Washington treaties, and that the United States and Japan were now spending $10,000,000 in improving their defense. He insisted that it had been perfectly understood at Washington that England retained full freedom of action regarding Singapore."

We read in the London *Daily Mail* that the Admiralty's proposal to spent £11,000,000 during the next ten years in constructing a great dockyard and graving-docks for large ships at Singapore is being severely criticized. It is pointed out, according to this daily, that the project might well be allowed to wait in view of the oppressive character of taxation in England; and Admiral Sir Percy Scott published a letter in this newspaper in which he attacked the proposal on the ground that the battleship is obsolete. Sir Percy Scott's objections are severely scored by the London *Saturday Review*, which believes the development of Singapore is "dictated by the soundest strategy," and observes:

"The Admiralty, unlike their critics, appreciate that an improvement in airplane design is not the late war's only legacy. From the naval point of view the war may be said to have reproduced the political situation of the year 1900. Ten years ago the disposition of our naval forces was dictated by the maritime strength of Germany and by the Anglo-Japanese Treaty. Today, neither the German Navy nor the treaty exist, and we have no choice but to return to the dispositions which obtained when the present century opened. There are some who consider that the maintenance of a fleet in the Far East is provocative to Japan, and they share with the *'Skibbereen Eagle'* the illusion that nations can be held in check by editorial fulminations. Others, again, while admitting the desirability of a Far-Eastern squadron, deny the necessity for storing and docking facilities nearer at hand than Malta, or else they suggest that the fleet shall carry with it a floating dock, even as an Englishman, according to Americans, travels with his bath."

Adverse critics object also to the provision of shore tanks for the storage of oil because, they maintain, "oilers" can at all times accompany the fleet. To this *The Saturday Review* retorts as follows:

"It may, therefore, be as well to mention that the original cost of a floating-dock is sixty-five per cent of that of a graving-dock; that a further twenty-five per cent would be expended in towing the dock to its station; that the cost of its upkeep is immeasurably greater than that of a graving-dock and its life little longer than that of a battleship. Further, a battleship, after a year out of dock, finds her radius of action reduced by forty per cent, and her loss of speed impairs the tactical efficiency of the whole fleet. Docked at Singapore she need not be out of action for more than a week; but if she were sent to Malta her services would be lost for at least a month. Lastly, the presence of oilers, as Von Spee found, greatly hampers a fleet when in touch with the enemy, and their own consumption of fuel very soon represents a serious depletion of the available supplies.

"Space and political considerations alike forbid the elaboration of local strategical questions. Our aim has been to expose the fallacy of the stock objections raised. But no one who glances at the map and bears in mind our interests in those regions can fail to appreciate the importance of Singapore or its geographical advantages as compared with Hongkong or any port in Australia. Financially, the heart of the Empire may be in London, but the time will come when the possession of Singapore will seem to us essential to our imperial existence."

The London *Daily Telegraph's* naval expert, Archibald Hurd, points out that a naval base at Singapore is necessary because—

"The battleship will continue to be the center around which fighting fleets in future will be built up. On that issue there is no difference of opinion among the responsible expert authorities, either in this country, the United States, or Japan. The matter has been repeatedly investigated, and always with the same result.

"Until a first-class naval base is developed at Singapore—there is nowhere else where one could be provided under the Washington Treaty which would satisfy naval strategists—battleships cannot be despatched to, and maintained in, the Pacific. However grave the situation which might develop in these waters at any future time, the British Navy would be debarred from exercising any such influence on events as it has exercised in the past, before capital ships had reached their present large dimensions, which have been further exaggerated owing to the necessity of providing them with 'bulges' against submarine attack."

Mr. Hurd goes on to say that the minds of the people of Australia and New Zealand, as well as elsewhere in the Dominions, may be "unnecessarily unsettled" by the criticisms of the plan to make Singapore a first-class naval base, and he tells us—

"It has been suggested that this development is being undertaken with the insidious purpose of suggesting to the people of these Dominions that they need battleships, and therefore, inferentially, that they should build them. It is not sufficiently well known that under the Washington Naval Treaty all the British Dominions have agreed not to build any capital ships during the 'naval holiday.' In those circumstances, therefore, it must be apparent that the Admiralty entertain no design of tempting the Dominions to embark on the construction of capital ships."

The reception given by the Sydney (Australia) *Sun* to the news that the House of Commons had voted for the establishment of the base by an overwhelming majority, contrasts surprisingly with Mr. Hurd's misgivings about the attitude of the Dominions. This action of the British Parliament "spells security for Australia," according to this daily, which adds:

"Now the gateway to the East will be held by a powerful guardian, able to open or close that strategic door, able to flank any Pacific sorties upon Australia.

"With this gift of safety, however, come obligations.

"That England expects this day every Dominion to do its duty—to cease leaning on the British taxpayer—was very obvious in the debate in Commons. It has been plainly put to us—'What will you contribute? Are you always going to sponge on John Bull?'

"At the forthcoming Imperial Conference the Prime Minister of Australia must be empowered to offer our insurance premium. We are in common decency bound to contribute to the upkeep of the fleet which will be based on Singapore, and the best way and the most self-respecting way is to build and man our own Australian fleet unit, and pay for its upkeep.

"The amount and method is for the Commonwealth Parliament to decide: but whatever the cost to us may be, we must not default. The race that reared the Anzacs cannot become a race of mendicants and spongers."

The Brisbane *Courier* also expresses approval of the Singapore project, and urges both Australia and New Zealand to co-operate with the Mother Country in the matter of defense. Referring to the preference of members of the Federal Labor party to have the naval base established at Sydney instead of at Singapore, this Brisbane journal observes:

"Britain's policy has always been in favor of deciding its great naval and military struggles within some waters or territory other than her own; and if Australia has to take part in some great war of the future, it is to

her interest to keep the fight as far away as possible from her shores. The British Government has chosen Singapore as the central naval base of the Pacific, because it lies within easy striking distance of the great trade routes of the Indian and Pacific Oceans; and any enemy, meditating an attack on the Australian trade routes, would have to meet and defeat the British Fleet that would be guarding those trade routes. So long as that fleet remained in command of the Pacific there would be no danger of any raid on the Australian coastal cities. When the British Government decided to concentrate upon Singapore, and carried its vote recently in the House of Commons, it did so upon the best expert advice. So far the nature of that advice has not been made public, but it may be taken for granted that one of the factors is the desire to save the Australian coastal cities from attack. An enemy would naturally attack the naval base, and if that base were in Sydney Harbor the city itself, as well as its sea-borne commerce, would be the pivot of operations if the fleet, while awaiting reinforcements, were forced back upon its base. Doubtless the Imperial scheme, which is to be essentially co-operative, will provide for an adequate floating dock in Sydney Harbor, and for oil-depots at other harbors along the Australian coast."—*The Literary Digest*, 4 August, 1923.

BRITAIN BEHIND IN CRUISERS.—It is no news, however, that the British Navy is dropping behind in respect of modern cruisers. It has nothing to touch the Japanese 33-knotters which are now coming into service so rapidly, nor has it any completed ship that compares in swiftness with the ten American *Omahas*. France is building three 8,000-ton ships with a designed speed of 34 knots. Adding the Japanese, American, and French programs together, we find a total of thirty-eight foreign cruisers all able to steam at 33 knots or more. Great Britain has but two ships, *E* class, designed for 33 knots, and, as the contract specifies this speed only when the vessels are in light condition, it will be safer to put their maximum service velocity at 32 knots. The only other British cruisers good for more than 30 knots are the *Hawkins*, *Frobisher*, and *Effingham*, to which may shortly be added the *Vindictive*, if it be true that the latter is to be reconditioned to her first design.—Hector C. Bywater in *Naval and Military Record*, 1 August, 1923.

ENGLAND'S TRADITIONAL NAVAL POLICY.—The preface of a rare, old volume published in 1735, entitled "*The Naval History of England in All Its Branches: from the Norman Conquest in the Year 1066 to the Conclusion of 1734*, written by Thomas Lediard, gentleman," is a remarkably terse and clear epitome of the whole naval policy and history of England, a policy as well recognized today as it was then—nearly two hundred years ago. It reads—

"It is a most undoubted Maxim, that the HONOR, SECURITY and WEALTH of this KINGDOM depends upon the Protection, and Encouragement of TRADE, and the improving and right Managing the Naval Strength thereof; And we have Instances of several Nations, who were formerly great and powerful at Sea, who, by Neglect and Mismanagement, have lost their Trade, and seen their Maritime Strength entirely ruined.

"These were the Words of the most August Assembly of the Nation, in an Address to the Throne, upon an extraordinary Occasion; And a Noble Member of that Illustrious Body, on another Occasion, as just observed; That 'our Trade is the Mother and Nurse of our Seamen; Our Seamen the life of our Fleet; And our Fleet the Security and Protection of our Trade: And that both together are the WEALTH, STRENGTH, and GLORY of Great Britain.'"—*Annual* of The Naval History Society, 1922.

BRITAIN TO BASE AIRSHIP PLANS ON U. S. PROGRAM.—London, July 26.—The British Government has decided to resume the development of airships for defensive purposes, but will wait to see what success the United States Navy has with the two great sky fighters, the *ZR-1* and *ZR-2*, now being built at Lakehurst, N. J., and the Friedrichshaven Zeppelin Works, before elaborating any technical program.

In informing the House of Commons of the Government's decision today, Sir Samuel Hoare, the British Air Minister, gave no hint of the real reason for the delay. He said a beginning was to be made with a commercial and mail carrying airship service, serving the Far East and Australia, but that nothing would be done until the scheme was laid before the Imperial Conference at London in October.

As the co-operation of the Dominions, and incidentally the Dominions' treasuries, is essential to the success of the plan Sir Samuel's explanation is understandable, but according to Commander E. S. Land, former naval attaché of the American Embassy here, "England and France are waiting to see how the new American airships perform before doing anything important." Commander Land was the American delegate to the world's aeronautical congress in London a few weeks ago, and just before leaving for home on the *President Roosevelt* today, he said:

"Probably because France and England intend greatly to expand their air forces they are awaiting the tests of American airships with even greater interest than that attached to the first of the type—the *L-38*, which burned at Hull two years ago. After that disaster Great Britain abandoned construction and experiments with lighter-than-air craft and it is unlikely, even now, that she will undertake anything on a grand scale without the benefits to be observed from tests of the new American ships."

Sir Samuel Hoare told the Commons that the Imperial Defense Committee attached considerable strategic value to airships and that the Imperial Shipping Committee regarded them as useful for mail-carrying to remote parts of the Empire.

Commander Land was accompanied home by Commander J. C. Hunaker, another American naval officer who has toured several Continental countries seeing what is being done in aviation generally, and especially that which is of interest to the American Bureau of Aeronautics.—*Philadephia Public Ledger*, 27 July, 1923.

ENEMIES OF THE BATTLESHIP.—Now that the development of the battleship has been arrested for at least ten years, the attention of naval constructors, marine engineers, and artillerists is naturally directed to the possibilities of technical improvement in smaller ships of war. Here there are both scope and incentive for progress. The term "auxiliary combatant ship" comprises everything below capital ships and aircraft-carriers, and the only restriction imposed is that the displacement must not exceed 10,000 tons or the gun caliber eight inches. There is no limit to the number of "auxiliaries" that may be built; but with light cruisers already costing from one and one-half to two million sterling, and submarines (e. g., the *X-1*) £800,000 apiece, financial exigencies will be quite sufficient to check unbridled competition in these types.

The spur to achieve maximum efficiency in each new class of auxiliary is the knowledge that with so few capital ships in existence, and those deteriorating year by year without chance of replacement, the smaller fry have become endowed with a higher relative value, strategically and tactically. For example, it is not to be supposed that Japan with a battle fleet of only ten units—including four ships verging on obsolescence—will spare any reasonable effort or expense to provide herself with a subsidiary fleet of the most powerful cruisers, torpedo craft, and submarines that it is

possible to build. This tendency to "go the limit" in each type is already manifest. Japan has just laid down two cruisers of the extreme displacement permissible under the treaty, and is about to begin work on two more. She is also building submarines of 2,000 tons or upwards. The United States has a program of eight similar ships in contemplation, besides three cruiser-submarines which may rival the *X-1* in dimensions.

France, not entirely satisfied with her three 8,000-ton ships of the *Lamotte-Picquet* class, proposes to go up to 10,000 tons in the six new cruisers authorized in the second half of the Navy Bill. Italian Press reports show the Ministry of Marine at Rome to be working on plans for several *incrociatori corrazzati* which promise to be most formidable ships, displacing 10,000 tons, with a speed of 33 knots, 5-inch side armor, and nine 8-inch guns. Both in Italy and France the triple 8-inch mounting appears to have been decided on for future cruisers.

When comparing ships built twenty or even ten years ago with present day designs it must not be overlooked that the turbine and the oil-fired boiler now enable much greater power to be obtained from a given weight of machinery. Moreover, thanks to progress in metallurgy, it is now possible to build ships of lighter scantlings without a proportionate sacrifice of strength. For a Navy whose sphere of activity is world-wide, sea-keeping qualities and radius of action are very important features in cruiser design, and for this reason we are not likely to see any British cruising ship overburdened with guns or armor. Under the Naval Treaty it would be permissible to build a submarine of 10,000 tons and arm it with 8-inch guns. It is not impossible that such monsters of the deep may be seen afloat in the course of a few years.

The limitation placed on aircraft carrier tonnage will not prevent the various Powers from utilizing other ships for the transport of aeroplanes. All modern battleships and cruisers are fitted to carry one or more of these machines. As the American *Omahas* class have equipment for taking four planes per ship, the ten vessels together will be capable of transporting no fewer than forty planes. According to unofficial forecasts of the new British battleships, the whole of the after-deck is left free for aviation purposes, so that apparently it is intended that each vessel shall carry a considerable number of aircraft.

During the past fifty years international naval competition has been chiefly expressed in terms of battleship tonnage. These vessels are still accepted as the key factor of strength, but their relative significance is declining both on account of artificial treaty restrictions and the increasing power of subsidiary types. If rivalry again develops between the maritime States it will be around cruisers, submarines, and aircraft. A contest of this kind might be less expensive, perhaps, than the former race for battleship supremacy, but it would, no doubt, be quite as dangerous in its reaction on political relations—more so, in fact, if the competitors devote their main effort to the multiplication of aircraft and submarines. —Hector C. Bywater in *Naval and Military Record*, 25 July, 1923.

## FRANCE

French Cruiser Launched.—Brest, August 14.—The light cruiser *Dugway Trouin* of the French Navy was launched today in the presence of Minister of Marine Raiberti. The Minister, in a speech, said that with 8,000 tons displacement she would develop 100,000 horsepower, and contrasted this with the pre-war battleships of 23,000 tons displacement and a maximum of only 30,000 horsepower.

The *Dugway Trouin* was laid down last August, and thus was launched within a year with her hull complete. She is the first of the three light cruisers forming the naval program voted in April, 1922, to be completed.

M. Raiberti in his address emphasized France's need of a fleet, but added:

"France's naval policy is a policy of peace. No people is more profoundly pacific. None has greater need for a long peace. None has greater reasons to detest war."—*Philadelphia Public Ledger,* 15 August, 1923.

TORPEDO PLANE A SUCCESS.—Paris, August 18.—The French Navy's self-starting super-torpedo plane had an official tryout at Villacoublay today. The machine behaved perfectly throughout the tests, it is reported, and the results were all that were wished for.

The new plane carries a torpedo weighing 1,500 pounds and has a speed of 169½ kilometers an hour. It can be slowed down to eighty-seven and one-half kilometers an hour. The electrical self-starter with the torpedo weighs 3,300 kilograms. It has a four-blade propeller and is driven by a 600 horsepower motor.

At today's tryout the plane rose 1,000 meters in seven minutes thirty-seven seconds and 3,000 meters in thirty-five minutes, thirty-eight seconds.

The torpedo, released from the machine twenty meters from the ground, fell horizontally and traveled 250 meters before stopping.—*New York Times,* 19 August, 1923.

WASHINGTON AGREEMENT RATIFIED BUT FRANCE MEANS TO REMAIN A GREAT NAVAL POWER.—By 460 votes against only 106 the French Chamber ratified the Limitation Agreement made by M. Briand at Washington, which might lead observers unacquainted with French feelings and ways to believe that France is delighted with the kindly thoughts of her Allies in authorizing her, as a reward for her war sacrifices, to come down to the naval level of Italy and to keep one battleship in commission against three for Great Britain and for America. Facts are very much otherwise, as subsequent events will show.

France feels deeply wronged in this regrettable affair, and anybody with a superficial knowledge of geography and of history, ancient and recent, will understand that Frenchmen reason just as Britishers would do, and it will be remembered that an eminent English Minister said lately, on the question of air power, that "it would be neither worthy nor prudent on the part of England to remain in a state of inferiority, and so at the mercy of France."

Why, then, has the Chamber ratified? For reasons mostly of internal policy and of political opportunity. Premier Poincaré himself obviously considers the treaty contrary to equity and to common sense, and had he been in power there would have been no "Washingtoning" of France. On the other hand, he is the embodiment of straightforwardness and loyalty, and he considers that the word of France, so lightly given by poor M. Briand, must be kept. France owes to herself to give to the world an example of respect of solemn treaties, and to prove that a promise made by a French Premier will never be in vain. Many deputies gave their vote out of personal devotion to M. Poincaré; others because they hold battleships to be worthless and consider the treaty will do good in compelling France to devote her naval activities to *poussière navale et aérienne.*

Good care was taken by Premier Poincaré and Minister Raiberti to limit the importance of the treaty in what concerns France's obligations. France ratifies because a promise has been made in her name, but only in what concerns battleships, for a limited time. Never again will she accept so unfair an arrangement. Moreover, she in no way considers the treaty as settling the question of rank among naval Powers, and means to preserve her complete freedom of action in what concerns all other classes of fighting ships, and, it is implicitly understood, to mark her meaning by doing more in light construction than she would have done otherwise.

Further, Premier Poincaré remarked the arrangement was made between allies; should the alliance and cordial relations come to an end France would instantly find herself free to resume battleship construction, as the treaty could not decently be made to serve the interests of any Power intending to attack France. To friends France could sacrifice something, not to potential enemies.

Those French reserves and misgivings the Senate will further accentuate when the ratification comes up for discussion. Already the Senate Marine Committee has urged that no limitations whatever be accepted in what concerns either the number or use of submarines, and confirmed the Chamber's decision that the treaty must not be regarded as classifying naval power and that France intends to preserve on the water the rank assigned to her by tradition and colonial and mercantile interests all over the world. In no case will France admit that the ratio applied to battleships be extended to light vessels and submarines. Lastly, it is again stated that the arrangement is of a provisory character, and should another Allied Power show hostility toward France the agreement would de facto come to an end, of course.

The opinion of the whole of France is that ordinary fair play was not respected in framing the Washington agreement. Deputé Le Cour Grandmaison had no difficulty in demonstrating that the proportion of armored ships allowed to France was a challenge to common sense. His demonstrations proved disastrous to the pro-English feelings that prevailed in the Chamber and in French public opinion on the morrow of the war. Short-sighted pro-German politicians have wrecked the dream of an Anglo-France which so many Frenchmen and Englishmen cherished as the right logical sequel to five years' fraternity of arms.

Under-populated agricultural France covets no more land in the sun, and she is probably the only world Power in that happy position; but, while respecting the rights and legitimate ambitions of others, she would like to preserve that little part of the world which sacrifice and work has gained to the Tricolour, and she is, moreover, extremely sensitive on the point of *honneur et patrie*. Those are very ignorant of psychology and history who thought that bullying could cow France down. The Washington affair France at large regards as an attempt against the national safety, and the foul plot France has the means of frustrating. She is by very far the strongest air Power, having most bombardment avions in commission, and at the same time being of all European Powers least vulnerable to aerial attacks on account of the agricultural nature of the country. As a retort to the Washington farce, influential deputies and senators are pressing the Government to add sixty-six submarines to the Government shipbuilding program, so that 100 submarines will be ordered within the next six or seven years. Similarly, the aerial program will be voted more quickly than it would have been otherwise, and much strengthened.—J. B. Gautreau in *Naval and Military Record*, 18 July, 1923.

## GERMANY

GERMANY OUTLINES 1923 AIR PROGRAM.—Washington, July 21.—Extensive development of Germany's air lines has marked the Allies' withdrawal of the restriction which forbade international air service by Germany. With the final delivery of the required aeronautic reparations, during the first quarter of 1923, Germany immediately entered upon an ambitious schedule of international flying says E. G. Eichelberger, of the Western European Division of the Department of Commerce, who has recently returned from Berlin.

In 1922 Germany's commercial aviation services comprised eight organizations. These eight have now been grouped into two large combinations,

the "Junkers Luftverkehr" and the "Aero-Lloyd." They include the Deutsche Luft Reederei, Lloyd Luft Dienet, Deutsche Luft Lloyd, Lloyd Luftverkehr, Bayerische-Rumpler Werke, Bayerische Luft Lloyd, and the Paul Strahl.

In practically every direction regular German air lines are either in operation or are being planned. At present Germany is placing her greatest efforts on air line connections with Russia, Scandinavia, and the Balkans. During 1922 irregular flights already were being made between Berlin, Moscow, and Petrograd this summer the line will be perfected, with regular connection with the Baltic States. The flight will be operated jointly by the two associations. Aero-Lloyd, operating to Danzig, and Junker continuing to Moscow. The flight from Berlin requires twenty hours and will be made three times weekly.

During the 1923 season, services to Budapest, via Munich and Vienna, will be undertaken; it is planned to extend this line to Belgrade, thus making it one of the most important connections with the East. The trip will include Geneva and Zurich in its course, and will require six hours.

The London-Amsterdam-Berlin line is being operated through an agreement between the English Daimler Air Service, Ltd., and the German companies. Four flights weekly from London to Amsterdam and return are provided for by the English company, while the German firms will provide service from Berlin to Amsterdam and return, connecting with the English line at Amsterdam. This flight also takes six hours. A similar agreement is reported to have been reached between the Aero-Lloyd and the Danske-Luftfartselskab for a line to run from Hamburg to Copenhagen, while Junker will operate between Hamburg and Kiel and Malmo (Sweden).—*Boston Transcript*, 22 July, 1923.

GERMANS MAY BECOME CITIZENS OF UNION OF SOUTH AFRICA.—Geneva, July 20.—A letter was read from Premier Smuts of the Union of South Africa, saying he believed the mandatory system was a great step forward. He explained that 7,000 Germans of former German Southwest Africa may elect to become citizens of the Union of South Africa, choosing a popular council and sending representatives to the Parliament of the union. —*Philadelphia Public Ledger*, 21 July, 1923.

GERMAN SUBMARINES STATISTICS.—One hundred seventy-eight German submarines were "lost in action" during the war, according to an official report just received by the Navy Department. The loss in personnel is given as 5,364, of whom 515 were officers.

Depth charges accounted for thirty-seven submarines, fixed mines for thirty-six, fights with enemy sumarines twenty, engine and other trouble fourteen, torpedo boats, destroyers and subchasers thirteen, accidental ramming eight, armed fishing craft six, airplane (bombing) six and submarine nets six. Twenty-one submarines were demolished or otherwise disposed of to prevent their capture by the enemy. Three were sunk by regular patrol vessels of the enemy, three by armed auxiliaries, two by cruisers and two by artillery fire from the shore. One was sunk by a liner at the entrance to the British main base of Scapa Flow, the famous *U*-29 under Captain Weddigen.

A chart accompanying the report shows that fifty-six of the undersea boats were lost in the English Channel, twenty-six in the North Sea, sixteen in the Mediterranean, sixteen on the east coast of England, twelve off the Dutch coast, three near Heligoland, two in Scapa Flow and the remainder in far separated spots in the world's oceans.

Of the boats interned before the German fleet was delivered to the Allies, the report says, five were sold to Spain and two to Holland, while fourteen were demolished.

Inspection of the boats of shipbuilding firms holding contracts showed that 281 submarines had been delivered and 197 were under construction when the armistice was signed.—*Army and Navy Register,* 21 July, 1923.

How Thirteen *U*-Boats Were Sunk.—Vice Admiral Sir Roger Keyes revealed a war secret regarding the fate of thirteen German submarines at Folkestone on Friday, when he was presented with the honorary freedom of the borough.

He stated that in October, 1917, a German submarine was blown up in Waterford Harbor. In three weeks she was raised, and most valuable information was found in her, comprising details as to how the German submarines got under or over the mine barrage across the Straits of Dover.

The Admiralty set to work, continued Sir Roger, and established a long line of small craft, manned by 150 fishing crews, many of whom came from Folkestone. The result was that thirteen German submarines were soon lying at the bottom of the Channel between Folkestone and Cape Grisnez.

Previously the losses of English merchant vessels had amounted to 70,000 or 100,000 tons per week, but that was reduced by 5,000 or 6,000 tons per week.—*Naval and Military Record,* 11 July, 1923.

## JAPAN

New Japanese Types of Ships.—Work has begun, it is reported from Tokio, on two cruisers of the latest and largest design, which were ordered last year from the Kawasaki Yard, Koebe, and the Mitsubishi Yard at Nagasaki. These are apparently the first of the four 10,000-ton ships authorized under the revised auxiliary program of March, 1922. The other two have been promised to the Government Dockyards at Kure and Yokosuka. Sasebo Yard is building one 7,100-ton cruiser, and the Uraga Dock Company is understood to have received the contract for a second. The present position in regard to Japanese light cruiser construction is therefore as follows: Completed since 1918, twelve ships, now building, nine; authorized but not yet begun, four ships. All these vessels are due to be in service by the year 1927. With the exception of the first two *(Tatsuta, Tenryu)* which can make 31 knots, they are designed for a maximum speed of 33 knots and a large radius of action. Those which have made their trials have in every case exceeded the contract speed.

The cruisers now coming into service are fitted with hangars and flying-off platforms for two aeroplanes. There is reason to believe that certain of the vessels are very lightly built, both as to hull and machinery, and it remains to be seen how they will stand the wear and tear of ocean cruising. Cases of engine-room trouble have already occurred, the most serious being a fatal boiler explosion in the *Natori.* On the other hand, all recent Japanese cruisers appear to be excellent sea boats. The defect of light armament from which the *Tatsuta, Kuma,* and *Natori* class suffers is to be remedied in the newer ships. An improved 6-inch gun, fifty-five calibers in length, is spoken of in connection with the 7,100-ton ships, while the four *Washington* cruisers of 10,000 tons are to mount six or eight 8-inch guns of fifty calibers.—Hector C. Bywater in *Naval and Military Record,* 1 August, 1923.

Tokio Jingoists Rattle Swords Over Singapore.—Tokio, July 22.—Swords are being rattled in the Orient by every Japanese jingoist in an endeavor to reveal the projected British naval base at Singapore as a direct threat against Japan. The same attitude is being gradually reflected by the general public, the masses who voluntarily contributed their pittances and paid a large proportion of the expense for the construction of their beloved Mutsu.

The Singapore project, which has been occupying large space in the Japanese press since the announcement from London that it had been approved in Commons, now has elicited expressions from official quarters intimating an uneasiness of mind which hitherto has been conspicuously absent since the Washington Conference.

"We must gird our loins," is a significant remark attributed to M. Takarabe, the Navy Minister, by peers who visited him for the purpose of discussing "the British threat." Takarabe has made no such statement directly, but this quotation is characteristic of the atmosphere in navy quarters.

Every influential newspaper in Japan has commented adversely on the proposed Singapore base, which has brought home forcibly the realization that the Anglo-Japanese alliance is now fading into history. Japan has been scrupulous in carrying out the spirit of the Washington treaties before final ratification, but criticism of other signatories evading the same spirit has been frequent here. Japan is eager to insure strict observance of all signatories of both the letter and spirit of the naval pact and the public generally shares the virtually unanimous newspaper opinion that the Singapore base, which was announced before France had ratified the naval treaty, is an unwarranted challenge. They feel also its implications are most serious.

"The capital ships and fortifications by the Washington Conference are not the only fields of naval competition," is a remark one hears spoken in tones of varying degrees of discretion in Tokio.

The conservative Tokio Asahi represents Japanese sentiment quite accurately when it declares the true spirit of the Washington Conference dictates a genuine participation in the League of Nations, which "the United States refuses to join for selfish reasons and to which Great Britain prefers the British Commonwealth. The Powers continue to replenish their armaments while nominally advocating peace, the ideals of the Washington Conference never will be realized."—*Philadelphia Public Ledger*, 23 July, 1923.

Analysis of Japan's Defense Problems.—An Examination In Some of the Economic as Well as the Military Phases of a Possible War With America.—London, August 2.—A lively discussion has been started in Japan by the appearance in the *Chuo Koren*, a monthly review printed at Tokio, of an essay by Captain Mizuno Hironori on national defense policy and the prospects of war with the United States. Captain Mizuno is a naval officer who got into trouble with the authorities some years ago for writing an article in which the intellectual capacity of Japan's military leaders was rather pungently criticized, and in consequence of this indiscretion he was relieved of an important post he had occupied at the Navy Department.

His latest essay is a powerful indictment of the main principles on which Japan's defensive policy is now based. Shortly after the Washington Conference stories appeared in the Japanese press concerning a new scheme which had been adopted by the general staff to insure the safety of the country in war despite its heavily reduced navy. Briefly, this was to consolidate Japan's holding in China and make such military dispositions as would guarantee the uninterrupted flow of foodstuffs and raw materials from China to Japan at all times and in all circumstances.

There was really nothing new about the scheme, since for many years past the general staff has attached supreme importance to keeping open the communications with the mainland, and the development of both army and navy has been largely governed by this idea. So far from it being a new discovery that Japan, in time of war, could not carry on for any length of time if her Chinese supplies were cut off, this fact has been

clearly recognized for at least twenty years and just as clearly reflected in Japanese policy throughout that period.

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A thorough knowledge of relevant political and economic factors is essential to any correct appreciation of war possibilities, yet it is precisely in this branch of knowledge that the members of the general staff are deficient. In proof of this charge the present dimensions of the Japanese Army are cited. The huge armies maintained by certain small European states are often referred to as evidence of unbridled militarism, but these states at any rate have the excuse of living in proximity to neighbors who are equally powerful and with whom their relations are frequently strained. No such pretext can be put forward by Japan for keeping up a peace army of twenty-one divisions.

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Who then, is the imaginary enemy against whom Japan is arming? Captain Mizuno frankly admits it to be the United States. To develop armaments without having some hypothetical foe in view would be tantamount, he insists, to shooting without a target. But he has grave doubts as to whether the general staff, having accepted the United States as the likeliest potential enemy, has troubled to weigh all the consequence of war with that country. Thinking mainly in terms of battalions and battleships, they have overlooked the far-reaching effect of economic elements on the course and outcome of modern wars, especially between belligerents who have previously maintained close commercial relations with one another.

It is with a due regard for these elements that Captain Mizuno attempts to outline the events of a conflict between Japan and the United States. He at once dismisses the theory that Japan would suffer blockade in the literal meaning of the word. To seal up the ports of a country which has a water front stretching over 1,000 miles from south to north would be quite impossible for a navy many times stronger than that of the United States. But in recent times the significance of "blockade" has become more elastic, and it is now used to denote even the partial suspension of foreign trade. In this limited sense Japan would undoubtedly be blockaded, for the whole of her trade with North and South America would be cut off.

Moreover, as the United States would send out cruisers, both regular and auxiliary, to intercept Japanese shipping in the Atlantic and the Mediterranean, traffic through these waters would probably decline by at least fifty per cent; and if the British colonies sympathized with the American cause Japan might find it difficult to obtain supplies from these countries. Assuming that she held control of the China and Eastern seas by capturing the Philippines, the region in which her ships could ply with comparative safety would be roughly marked by a line drawn east of India. If, on the other hand, she failed to seize the Philippines, the safety zone would not extend southward beyond the Straits of Formosa.

And so, having regard to this probable interference with their overseas trade, Japanese strategists have good reason to lay stress on the importance of making good the deficit by drawing increased supplies from the Asiatic continent. But the method by which they propose to do this is open to question. Their plan is to use the Army to extort from China the maximum quantity of foodstuffs and raw materials which she is capable of producing.

"If so," remarks Captain Mizuno, "Japanese militarists are still treading in the footsteps of Germany, who drew upon herself the censure and hostility of the world by trampling upon the neutrality of Belgium. No

wonder," he adds "that China should dread and hate and turn her back on Japan."

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Iron is the most important, for it has been estimated by Japanese military statisticians that in the recent World War every soldier must have expended from 3 to 3.8 tons a year, and an army of 1,000,000 men would thus require between 3,000,000 to 3,800,000 tons of iron a year so long as the war continued. In a conflict with America the Japanese Army would probably not have to do such hard fighting as occurred in Europe, but even so the national consumption of iron would be about three times greater than in normal times.

If all the furnaces in Japan, Korea and Manchuria were operated at their full capacity, it is calculated they could produce each year 1,360,000 tons of pig iron and 2,150,000 tons of steel. This is probably an overestimate, for even in the boom year of 1919 the output of steel did not go above 620,000 tons. Two-thirds of all the iron ore smelted in Japan is shipped from China, the balance coming from her own mines and those of Korea. In addition she imports from other countries iron ingots, plates, bars, etc., to the amount of some $78,000,000 per year, America's share in this trade being sixty per cent.

Japan is therefore largely dependent on external sources for her everyday supplies of iron. Even if China's contribution were guaranteed in time of war, a grave shortage would inevitably be caused by the failure of imports from elsewhere, and it is difficult to see how the requirements of army and navy could be met if the war were prolonged.

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In all likelihood, Japanese military occupation of the industrial regions in China would lead to a marked falling off in production.

Next in importance as a war commodity is raw cotton. Fifty per cent of the total value imported comes from America, and only five per cent from China. If the British Government allowed Indian cotton to be exported to Japan the latter might have enough for the manufacture of explosives and also for her people's clothing; but the cotton spinners would be ruined, and as this is the staple industry of Japan the blow to her economic system inflicted by the stoppage of American cotton would be extremely serious.

Oil has now become an indispensable lubricant for the machinery of war, yet Japan has very little of her own, and what she produces would not keep her navy running for a month. In normal times she has to purchase about sixty per cent of her oil abroad, mainly from America. On the outbreak of war the demand would at once increase from four to sixfold, yet the main source of supply would no longer be available. The shortage of oil is rightly described by Captain Mizuno as "a fatal flaw in Japan's national defense." This is also the reason why she clings so tenaciously to northern Sakhalien, where very rich oil fields are believed to exist.

As regards war-time supplies of wool and woolen textiles, these would depend on whether communication with England, Australia and Africa could be kept open, both politically and strategically, for it is from those countries that Japan obtains the great bulk of such material, which would be absolutely necessary for the clothing of her army.

That the value of China as an emporium in time of war has been grossly exaggerated by Japanese militarists is made quite clear by the foregoing analysis. All that China could supply would be the greater part of the iron needed, one-twentieth of the cotton, and a certain proportion of the cereals and other foodstuffs. These alone would certainly not enable Japan to keep the war going, but they represent, for the time being

at least, the utmost that she could hope to squeeze out of China, however severe the military pressure she brought to bear on that country.

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But if anything is certain in this world it is that war with the United States would be utterly ruinous to the trade of Japan. In the *Chuo Koron* article already quoted, Captain Mizuno goes into that matter at some length, endeavoring to prove—which is not difficult—that the economic results of such a conflict would be deadly to his country.

This he does by citing of few statistics. For example: Of the $259,000,000 worth of raw silk and silk goods exported in the year 1921, eighty-two per cent went to America. Consequently, the closing of this market would react with crushing effect on the silk industry, reducing it to absolute ruin.

During the same year cotton yarn and cotton goods to the value of nearly $150,000,000 were exported, and practically the whole of this trade would vanish if, as is most probable, Japan's supply of raw cotton ceased with the coming of war. Silk and cotton exports represent between them sixty-six per cent of her total export trade, two-thirds of which would thus be lost at a stroke.

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At a liberal estimate she would stand to lose seventy-five per cent of her export trade in the event of war with America, and what remained could only be carried on if her merchant shipping were unmolested in European waters as well as in the Eastern seas. If, on the other hand, American cruisers were at all active, her foreign trade would come to an absolute standstill.

The results of this economic paralysis would be infinitely more serious to Japan nowadays than might have been the case a decade since, for during the interval a much larger proportion of her population has come to be dependent on foreign trade for its subsistence. Many millions of work people would be thrown out of employment, with no prospect of immediate relief, and something like social chaos would ensue.

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Japan would require large quantities of oil for her fleet, but what chance would she have of securing them in the teeth of American competition? And how much wool could she obtain from Australia if American purchasers, with unlimited funds at their back, raised her on every bid?

Discussion turns next to the probable attitude of China in the event of an American-Japanese war. China, having no love for her island neighbor, would not hesitate to embarrass the latter, and this she would be able to do with perfect propriety. That she would ally herself with one or other of the belligerents is not to be expected. Though presumably sympathetic toward America, an open espousal of the American cause would place her completely at the mercy of Japan and enable the latter to make full use of Chinese resources without any breach of international law. The only positive military result of such action would be to immobilize a large section of Japan's army in Chinese territory, but Japan in any case would be compelled to maintain strong garrisons there for reasons already stated.

China's alternative would be to proclaim neutrality, thus rendering it impossible for Japan to commandeer foodstuffs and materials without incurring the universal odium that descended on Germany when she broke through into neutral Belgium. This, then, is the course that China is most likely to adopt, but the serious predicament in which it would place their country does not seem to have been envisaged by Japanese militarists.

As for the other powers, it is morally certain that none of them would be inclined to join in the struggle, least of all on Japan's side. If things went badly for Nippon, Russia might seize the opportunity to revenge itself for the many injuries she has suffered at Japanese hands.

But the dominant factor in the situation would be the attitude of Great Britain and her Dominions. Australia, New Zealand, Canada and South Africa are all antagonistic to Japan, while the recent cooling of Britain's former friendship has been so obvious as to attract widespread notice. On the whole, therefore, the British Empire's demeanor would be one of benevolent neutrality toward the United States, and Japan would be left to fight her battle single-handed in the depressing knowledge that any success she gained would be thoroughly unwelcome to most of the onlookers.

Examining her military resources, they are found to include an army with a peace strength of twenty-one divisions, totaling 230,000 men. By calling out the trained reserves this establishment would be raised to 2,000,000. How an army of this size could be usefully employed in a war against America is a mystery not easily solved. According to the official program of defense, it is to be used for garrisoning Formosa, Sakhalien, Korea and the outlying regions of Japan proper and for "taking military action in a certain area on the Continent"—in other words, forcing China to fill the Japanese war magazines.

But, says Captain Mizuno, "if all the provinces of China are to be overrun by troops for the purpose of extorting war supplies from that country, an army of fifty of even sixty divisions would be too small to do this work, even if it could be done without arousing the opposition and intervention of the powers."

Captain Mizuno betrays no secret when he affirms that the Japanese Army, in spite of its huge personnel, compares badly with Western armies in respect of equipment. Its gas and tank services are in their infancy, and machine guns are so scarce that the recent announcement of the formation of special machine gun sections was greeted by the newspapers as "opening up a new vista of scientific warfare"! Even today machine gun drill has to be carried on mainly with dummy weapons.

Aviation is still more backward. According to one authority, it is now in just about the same stage that it had reached in Europe before the war. Yet aircraft are clearly destined to play a most important part in future warfare, and Japan is peculiarly vulnerable to attack from the air, owing to the unsubstantial nature of her buildings and the fact that, being an island, hostile airplane carriers could attack her from all points. So seriously is this menace regarded that the authorities are often urged to effect sweeping reduction in the army and navy in order that more money may be available for strengthening the air fleet.

In conclusion, Captain Mizuno urges that the whole problem of Japan's position in case of war with America be reconsidered by expert economists, who are better qualified than soldiers to forecast the issue of a struggle which would be decided largely, if not mainly, by economic forces. If the matter is left entirely in the hands of the military men, he thinks disaster will be inevitable, for they are chiefly concerned to protect their own position and influence by maintaining armies and fleets of unnecessary strength. He says, in effect, that the nation cannot trust its military leaders after the proofs of incompetence they have given by drawing up a program of defense which is demonstrably unsound.

This article should serve as a corrective to the view which appears to be held by so many Japanese soldiers and journalists that war with the United States would be a mere military parade leading to a swift and certain triumph.—Hector C. Bywater in *Baltimore Sun*, 17 and 18 August, 1923.

U. S. Radio Grant In China Protested By Japan.—Tokio, August 17.—Japan will continue to protest to China against her recent wireless concessions to the Federal Telegraph Company of America whereby five wireless stations will be constructed in China. The ground is taken that the Mitsui Company of Japan was granted a previous wireless monopoly.

At the same time officials hope that the Federal and Mitsui Companies will reach an agreement such as that existing among the Japanese, British and French, to prevent what the official consider "suicidal competition."

The opinion is expressed that the prospective arrangement between the Radio Corporation of America and a Japanese syndicate, recently organized to improve Japanese-American service, may influence the Federal Telegraph Company. The Mitsui Company has already consented to make an agreement.—*Baltimore Sun*, 18 August, 1923.

Japanese Defend South Sea Rule.—Geneva, July 20.—Japan, reporting to the permanent mandates commission of the League of Nations, claims her administration of the South Sea Islands north of the equator for 1922 has been liberal and progressive.

That the commission will insist on its prerogative of criticizing the handling of the territories was made clear at today's session, when Marquis Thedoli, its president, protested against the assembly's criticism of the commission's policy of publicity. He insisted that the commission's views should always be freely voiced, as otherwise abuses might develop.

The report sets forth that the Government promulgated modern judicial regulations, extended the school system, created an industrial laboratory for development of the island industries, subsidized local navigation companies and gave the villagers the right to effective participation in the insular governments, allowing them to address petitions to Tokio.

It also emphasizes that Japan, in fulfillment of her promise, withdrew all naval units in April, and that no fortresses or military organizations exist, the maintenance of order being exclusively in the hands of the police.—*Philadelphia Public Ledger*, 21 July, 1923.

U. S. Opposition to Freeing Philippines Scored in Tokio.—Tokio, August 1.—The present Administration's opposition to Philippine independence is described by this morning's *Hochi Shimbun*, Tokio's largest newspaper, as a reversal of the Wilsonion policy that must be looked on with suspicion.

"The only conclusion we can draw," it says, "is that the American Government is skeptical of the virtue of decisions reached at the Washington Conference, of which it was the chief sponsor."

The United States is afraid to grant independence, fearing the ambitious designs of a "third country," the *Hochi* continues, stating that means only Japan. The paper declares the ratification of the Washington pacts destroys the American argument. "The attitude of the American Government toward independence deserves the closest attention," it concludes.

Another favorite theme recently is the failure of other signatories to observe the spirit of the limitation treaties. The nationalistic *Yorodzu Choho* today declares editorially: "Japan is the only country carrying out armament limitation earnestly." It accuses the United States of boldly pushing a militaristic policy and enforcing the military education of civilians.

"Our negative retrograde policy is the cause of China's contempt for Japan," the paper concludes, warning that "it is dangerous to be misled by the mendacious pacifism advocated by the Western peoples into a real effort for armament limitation."—*Philadelphia Public Ledger*, 2 August, 1923.

## UNITED STATES

MOST POWERFUL BATTLESHIP AFLOAT.—The United States battleship *Colorado*, the mightiest vessel of her class afloat, is rapidly nearing completion at New York Shipbuilding Company's yards, Camden, N. J. She will be delivered to the Navy at Philadelphia September 1. The *Colorado*, which will be in command of Captain Reginald R. Belknap, is electrically equipped and propelled and in gun power, rapidity of action, facility of control and thoroughness of protection surpasses all other capital vessels. Her main battery consists of eight 16-inch guns, which are the most powerful of naval weapons. Her electrical drive permits the use of her full power for both forward and reverse operation, thus providing the highest degree of maneuvering power, and her system of protective belts, decks and water-tight compartments is especially designed to resist airplane and submarine attack.

The *Colorado* is 624 feet long, displaces 32,600 tons and has a speed of 21 knots. She burns oil and her two 15,000 horsepower Westinghouse steam turbines supply electric current to four 8,000 horsepower Westinghouse motors, which drive her propellers.

Her gun sighting and fire control systems have many unique features which enable her to fire more quickly and accurately than any enemy vessel. She will go into commission in the early fall and will be manned by 1,403 officers and men and will immediately start on a cruise around the world before joining the Battle Fleet.

The *Colorado* is the last battleship the United States will build for some years, in accordance with the recent international naval agreement. The *Colorado* will leave Philadelphia about September 15 and go to New York Navy Yard, where some additional apparatus will be installed prior to shake-down trip. Perhaps she may return to the eastern coast for further attention before going on the cruise intended.—*Army and Navy Journal*, 11 August, 1923.

THE TWO GREATEST FLEETS.—Two new United States battleships are due to hoist the pennant this month. They are the *Colorado* and the *West Virginia*, authorized as long ago as 1916, but not actually laid down till 1919 and 1920 respectively. Both ships are sisters of the *Maryland* and, like her, displace 32,600 tons. Their designed speed is 21 knots and their main armament eight 16-inch guns. With the completion of these two vessels the American quota of capital ships as regulated by the Treaty will be full, and two surplus units, the *Delaware* and *North Dakota*, must go to the scrap-heap. Pending the completion of our new battleships, the United States Navy will possess in these three *Marylands* the most powerful squadron afloat, with a broadside of twenty-four 16-inch guns. Of its remaining fifteen ships eleven are armed with 14-inch and four with 12-inch guns. When the *Nelson* and the *Rodney* are commissioned our battle fleet will consist of twenty ships, with an aggregate displacement of 558,950 tons, as compared with eighteen American ships of 525,850 tons. In weight of fire the advantage would lie with us, as our twenty ships will amount to 166 guns, which discharge 297,000 lb. at a single broadside. In volume of fire the American fleet is superior, mounting as it does 182 guns with a broadside of 261,840 lb. The average speed of the British ships is considerably higher on account of the inclusion of four battle cruisers able to steam 21 to 31 knots, five 25-knot *Queen Elizabeths*, and five 23 or 22-knot *Royal Sovereigns*. None of the American ships are designed for more than 21 knots, and several of them are limited to 20½ knots. Furthermore, six of them are coal burners, whereas all our twenty vessels have oil-fired furnaces. Scanning other points of difference between the two fleets, it will be found that of vessels laid down since 1914

the American includes eight and the British five, but, on the other hand, the American age average is raised by the inclusion of four 12-inch gun ships which date from 1909-10 and are therefore considerably older than any ship in our post-Treaty fleet. Finally, ship for ship, the Americans probably have better armor protection, though in most of them the anti-torpedo defense appears to be below the British standard.—*Naval and Military Record,* 1 August, 1923.

NAVY CONSTRUCTION PROGRAM.—The addition of three mine-laying submarines to the recommendations which will be sent to Congress by the Navy Department is regarded in well informed circles as one of the effects of the ratification of the Arms Treaty by France. The conditions under which France ratified the treaty remove the limitation on submarine construction and repudiated the Root resolution. Although the naval authorities are silent on the subject, it is known that France's attitude on the submarine question will enlarge the program of the great naval powers for undersea construction.

The new construction that the Navy Department will ask for at the approaching session now consists of eight 10,000-ton scout cruisers, four river gunboats, six submarines of which three are fleet submarines and three are of the mine-laying type.

There is also a great deal of discussion of the airplane carrier question. Under the treaty Great Britain and the United States are limited to 135,000 tons of airplane carriers above 10,000 tons rating. The converted battle cruisers will absorb all but 65,000 tons of this allowance under the treaty. The question naturally arises whether it would be advisable to build large airplane carriers of the tonnage of the converted scout cruisers or build smaller ships. It is understood that the authorities are inclined to smaller carriers.

In this connection attention has been called to the fact that no limitation has been placed on airplane carriers of 10,000 tons or smaller. Their recent experience with scout cruisers has demonstrated that high speed afloat can be attained by 7,500-ton warships. It has been suggested that the adoption of a 10,000-ton type airplane carrier with a 35-knot speed might solve the problem better than larger ships. In the organization of the fleet this would enable the commander of the fleet to make a better distribution of his air force, it is urged, than to have all of his airplanes aboard larger ships.

It is possible that some recommendations for a program of airplane carriers may be added to the Administration's recommendations to Congress.—E. B. Johns in *Army and Navy Journal,* 4 August, 1923.

SUBMARINE PLANES READY.—The MS submarine planes from the Glenn L. Martin Company at Cleveland are now ready for shipment. Five of them will be sent to the Naval Air Station at Hampton Roads, Va., and one to the Naval Air Station at Anacostia, D. C. The planes at Hampton Roads will be put into actual service with submarines as soon as practicable. The plane at Anacostia will be used for experimental and test purposes.

These planes will be the first planes to be placed on submarines on this side of the Atlantic. They are to be used for observation and scouting work in connnection with submarine operations.—*Aviation,* 6 August, 1923.

VACANCIES IN NAVAL PERSONNEL.—At present the line of the Navy is 955 officers below its statutory strength of 5,499; the statutory strength of the medical corps is 1,225, and there are 442 vacancies; 189 officers are allowed the dental corps, and there is a shortage of forty; supply corps

allowed 660 and short seventy-four; chaplains allowed 151 and short sixty-six; construction corps allowed 275 and short fifty-two; and the corps of civil engineers allowed 110 and short twelve. The personnel of the staff corps, so far as actual increase in their numbers is concerned now is being administered under a so-called "budget" system, which in some cases prevents acquirement of new officers and in other cases limits acquirement to figures below the statutory allowances. Although the medical corps is allowed 1,225 officers by law, under present limitations it can not increase its present membership of 783 beyond 850. The chaplains, of which 151 are allowed by law, now are limited to an increase from its present actual number of eighty-five to 100. It is the intention not to take any new officers at present into the dental, supply, construction, and civil engineer corps.—*Army and Navy Register*, 21 July, 1923.

REPORT OF NAVAL BASE DEVELOPMENT PROGRAM, TO SECRETARY OF THE NAVY.

1. This report deals with all bases and stations, except air stations, which are customarily appropriated for under the annual appropriation "Aviation," and except fuel oil depots, the capacities of which are now being increased under the law providing for the use of the proceeds of royalty oil for that purpose. Also, the development of naval communications ashore is not covered herein, as such development is customarily appropriated for under the annual appropriation "Engineering." The Board takes cognizance of the fact that, under the status quo agreement of the Treaty for the Limitation of Naval Armament, no naval base development can be made by the United States in the Philippine Islands, Guam and Samoa, and, therefore, does not include any estimates for development in these places.

2. Restricting comment to the continental coast of the United States, the Hawaiian Islands, and the Canal Zone, the Board finds that the bases and stations there located are so lacking in capacity to serve the fleet that the mobility of the fleet is seriously impaired, and the fleet cannot deliver its most powerful effort.

3. Comparing the state of development of the fleet with that of the shore establishment as each exists today, the shore establishment is behindhand.

4. This condition arises, first, from the fact that rapid advance has been made in recent years in the number, size, and characteristics of naval vessels, including aircraft; and, second, from the fact that it has been more difficult to secure appropriations for the shore establishment than for ships.

5. The United States naval shore establishment has not one station which fully meets the requirements of a naval base. The only area which approaches these requirements is the Chesapeake Bay area. The Chesapeake Bay area is lacking in certain destroyer and submarine facilities, supply facilities, and industrial facilities which can be supplied at an estimated cost of about $7,000,000.

6. No other naval station approaches the total requirements of a naval base. The deficiencies of the other areas designated as bases in the report of the Rodman Board are great. For example, in order to secure safe anchorage for the fleet, which is a necessity in any naval base. extensive dredging and channel improvements are necessary in the Island of Oahu to create a naval base in the Hawaiian Islands; the dredging of Hell Gate in New York Harbor to accommodate the largest and deepest draft naval vessels is essential to the creation of the New York-Narragansett Bay base; the establishment of operating, supply and major ship drydocking and repair facilities is necessary at San Francisco Bay; and a drydock of the largest size, with additional berthing and repair facilities, is necessary at Puget Sound. Other bases and stations require improvements to a less degree.

7. The estimated cost of the necessary improvements and additions to the shore bases and stations is as follows:

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| Naval Base, Hawaiian Islands | $ 42,528,200 |
| Naval Base, San Francisco Bay | 26,529,950 |
| Naval Base, Puget Sound | 23,605,500 |
| Naval Base, New York-Narragansett Bay | 12,430,000 |
| Naval Base, Chesapeake Bay | 6,750,000 |
| Naval Base, Canal Zone | 1,815,000 |
| Naval Base, San Diego | 17,101,000 |
| Naval Base, Boston-Portsmouth | 6,360,000 |
| Naval Base, Key West, Fla. | 1,485,000 |
| Naval Base, Charleston, S. C. | 1,514,500 |
| Naval Training Station, Great Lakes, Ill. | 3,095,000 |
| Marine Corps, Expeditionary Force, Base, Quantico, Va. | 8,000,000 |
| Navy Yard, Philadelphia, Pa. | 2,012,000 |
| Navy Yard, Washington, D. C. | 335,000 |
| U. S. Naval Academy, Annapolis, Md. | 1,600,000 |
| Naval Proving Ground, Dahlgren, Va. | 112,300 |
| Naval Station, St. Thomas, V. I. | 52,300 |
| Naval Station, Guantanamo Bay, Cuba | 160,250 |
| Total | $155,486,000 |

8. In estimating upon the developments needed at each base and station, the Board has been governed by the following principles:

"The improvements needed to meet the ordinary peace time demands of the Treaty Navy have first been laid down and included in the estimates. The extra requirements, so far as can be foreseen, that would be necessary in time of war have next been laid down: but *only those extra war time requirements which cannot be secured by using existing commercial facilities, or be quickly extemporized*, have been included in the estimates. In all cases the Board contemplates the fullest possible utilization, in war, of the existing commercial railroad terminal storehouse facilities; commercial piers; wharves and store houses; commercial marine fuel plants; and commercial shipyards, drydocks, and repair plants."

9. When all the work included in these estimates is accomplished, the United States will not have a complete system of naval bases and stations, fully equipped for war, and largely lying idle in peace. The cost of such a system of naval bases fully equipped for war would be prohibitive in the first place, and unwarranted in the second. What the United States will have is a system of naval bases well equipped for the necessary peace time operations of the Navy, and susceptible of rapid expansion by the absorption of existing commercial facilities, and the addition of temporary facilities, into complete bases for war. This system will not include a base in Alaska, or in the Eastern West Indies, and the stations in the Philippines, Guam and Samoa will be in the status quo as of February 6, 1922. The condition of the stations in the Philippines, Guam and Samoa is discussed below in paragraph 17.

10. The total estimated cost of improving the United States naval bases and stations as above outlined is about equivalent to the cost of seven battleships of the *California* type. The United States cannot, under the Naval Treaty, increase the mobility of its battleships, but it can greatly increase the mobility and effective fighting value of the limited number of battleships allowed under that treaty by building up the naval bases and stations as herein recommended. Until the bases and stations are built up as herein recommended, the United States cannot utilize the full potential strength of the fleet.

11. Pursuant to your order, the Board has prepared a Naval Base

Development Program, wherein all improvements found necessary in accordance with the principles enunciated above have been listed according to their urgency or priority, as given in the approved naval plans for National defense, the projects being divided up for performance so that an equal expenditure will be incurred yearly for a period of twenty years.

12. The items of this program are those that would be immediately necessary in the event of war. To spread their completion over a period of twenty years is a risk and is a postponement of that degree of preparedness which constitutes good national insurance, and which is most effective in furthering our national policies during peace. Therefore, if the national finances should, during the twenty-year period under discussion, permit of pushing this program to a more rapid completion, the Board recommends that it be done.

13. The estimates for each project should be revised at the time when the item becomes due, according to this program, for inclusion in the Budget. This revision should not only include a new computation of cost, but a review of the facts governing the necessity for the item. Advances in the art of Naval warfare may be expected to cause changes in the kind and extent of the development of bases and stations. The Board notes that your order governing the Board's procedure recognizes this fact and contemplates an annual revision.

14. Further pursuant to your order, the Board has prepared an itemized list, with estimates in detail, of all the items of the above Naval Base Development Program allocated for inclusion in the Budget for the fiscal year 1925. The items in this list have been chosen, as stated above, according to their urgency or priority as given in the approved naval plans for national defense. They are those which the Board considers should be performed during the fiscal year 1925, in order to initiate and carry on a systematic development of the shore establishment of the Navy at a reasonably rapid rate, to the end that a complete development, as far as can now be foreseen, may be had in the definite period of twenty years.

15. The Board has excluded from the above Naval Base Development Program Budget for the fiscal year 1925 five items which ought to be in the Budget 1925. These items cannot be so included, because legislative authority for their performance has not yet been secured. The Board understands that the Navy Department is taking steps to secure the legislative authority for these items this year, in order that the items may be included in the Naval Base Development Program Budget for the fiscal year 1926. In preparing the 1926 Budget, the Board will include the items, which are as follows:

Naval Operating Base, Alameda:
toward the development of;
Marine Corps Depot of Supply, San Francisco, Cal.:
construction of;
Rifle Range, Puget Sound, Wash.:
purchase of land and construction of;
Navy Yard, Norfolk, Va.:
purchase of small tract of land opposite Drydock No. 4 to secure a 1,000 ft. Turning basin;
Marine Corps, Quantico, Va.:
acquisition of the town of Quantico, Va., including improvements thereon.

16. As the Naval Base Development Program is designated to cover only the needed development of Naval Bases and stations, as distinguished from repairs and replacements, estimates are not included for major repairs and replacement items which have in the past been requested in the Budget as separate Public Works items. Thus, it is seen that some major

repair or replacement items will be necessary each year, in addition to the items of the Naval Base Development Program.

17. Recognizing the fact that, under the Status Quo agreement of the Treaty for the Limitation of Naval Armament, no development of the existing facilities for the repair and maintenance of naval vessels at the naval stations in Guam, the Philippine Islands and Samoa can be undertaken, the Board finds that there are certain items of maintenance, repair and replacement of the facilities and equipment that existed at the stations in Guam, the Philippines and Samoa on February 6, 1922, which are needed in order to maintain these stations in an efficient condition. The performance of repair and replacement items such as is customary in Naval and Military establishments in time of peace is authorized in the Treaty. The Board finds that items of the following total cost, which fall under the category of repair and replacement of worn-out equipment, are needed:

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|---|---|
| Naval Station, Cavite, P. I. | $1,569,000 |
| Naval Station, Guam | 714,000 |
| Naval Station, Samoa | 145,000 |

18. The Board regards the prompt performance of the work covered by the above estimates at Cavite, Guam and Samoa to be very important, and for that reason, has prepared a detailed list of items, together with a recommendation as to the time when the work shall be performed. It will be noted that under Cavite there are several items that pertain to moving facilities from the Naval Station, Olongapo, to Cavite. The Board notes that the Department has referred the matter of consolidating all activities previously existing at both Cavite and Olongapo and locating them at Cavite to the State Department, and that that Department has declared that such procedure is not in contravention of the Treaty. The Board is informed that the State Department has notified the Governments signatory to the Treaty for the Limitation of Naval Armament of the intention of the United Sates Government to move the drydock "Dewey" from Olongapo to Cavite.

The above report was approved by the Navy Department on June 26, 1923, with the proviso that from time to time it may be necessary to change the amounts and the period of years over which the Naval Base Development Program is predicated.

(Signed)

T. Roosevelt.

*Acting Secretary of the Navy.*

## MERCHANT MARINE

British Liners Pinched by U. S. Competition.—London, July 20.—British shipping lines are feeling the pinch of American competition. That became increasingly apparent today with the announcement that the Cunard Line had cancelled Friday's sailing of the *Saxonia* and that the *Mauretania*, which arrived at Southampton Monday, would get its "annual summer time rest cure" before resuming trans-Atlantic crossings. It means that during the present week only two British liners will leave England—the *Homeric* and *Franconia*—while the United States lines will start three well-patronized vessels toward New York.

That the Cunard Line should take the record-holding *Mauretania* out of service when trans-Atlantic traffic is at its height, is regarded as an indication that the owners intend to take no risk of honors for the fastest voyage being nabbed by the new American grayhound, the *Leviathan*. The *Mauretania* is being thoroughly overhauled by an army of engineers and workmen during her fortnight's rest and will be ready to meet any challenger when she re-enters the service.

The cancellation of the *Saxonia's* sailing is offially accredited to the dock workers' strike, which prevented her taking on a cargo at London;

but elsewhere that is regarded as a bit of expediency, especially in view of the fact that the *Franconia's* sailing date has been put over one day to Sunday.

Tomorrow will be the first Saturday since early summer on which no British liner departed for New York. The *Berengaria* will get a fortnight's rest when she next arrives at Southampton. Meanwhile the *President Adams* and the *America*, of the United States lines are leaving Saturday with an aggregate of 1,000 passengers.—*Philadelphia Public Ledger*, 19 July, 1923.

SWEDEN'S MERCHANT FLEET.—On July 1 the Swedish merchant fleet numbered 1,270 steamers of 956,590 gross tons, 853 motorships of 275,000 gross tons, and 794 sailing vessels of 100,460 gross tons—a total of 2,917 ships of 1,282,050 gross tons.—*The Nautical Gazette*, 4 August, 1923.

OWNERS OF DUAL TYPES ALWAYS PREFER MOTORSHIPS.—A convincing proof of the popularity of the motor vessel in comparison with the steamer is furnished by the policy of shipowners who have gained experience with both classes of craft. If, after this experience has been obtained, the new vessels are invariably motorships, even the most conservative shipowner or shipbuilder cannot cavil at the statement that the oil-engined vessel is commercially the more economical, and that it will ultimately replace the steamer, points out *The Motor Ship*.

Many instances have already been given of shipowning companies which have sold or are gradually selling all their steamers, and are replacing them by motorships. The experience of the Dutch firm, the Rotterdam Lloyd Steamship Company, is interesting in this connection. In their last annual report it was stated that their first motorship, the *Kedoe*, had run over 62,000 miles without a single mishap, and that her working expenses were considerably lower than for a steamer of the same carrying capacity.

As a result of careful consideration the directors had become convinced that the question of ship propulsion by internal combustion engines had been completely solved, both technically and commercially. While the cost of a motorship is higher than that of a steamer, the Rotterdam Lloyd decided, in view of their experience, to make their next passenger ship a motor liner rather than a steam-driven vessel.—*The Nautical Gazette*, 21 July, 1923.

ERRONEOUS IDEAS ABOUT GERMAN SHIPPING.—The quintupling during the last four years of the remnants of Germany's pre-war merchant fleet together with the record breaking tonnage movement at German ports in recent months has given rise to the impression that German shipping must be in an exceedingly prosperous condition. That such an assumption was unwarranted was pointed out last week to a representative of *The Nautical Gazette* by Director Carl Stapelfeldt, of the North German Lloyd, who is here on a brief trip of inspection.

* * * * * * * *

"This is far from being the case, however. Consider, for example, last year's receipts of my company which is one of the foremost German steamship enterprises. Its gross earnings in 1922 were only 733,534,082 marks. Even if the mark be valued at 20,000 to the dollar this would be only the equivalent of $36,675. This entire sum would not suffice to pay for the construction of one small ocean-going steamer. While the rapid depreciation in the value of the mark is enabling all German steamship companies to show fabulous paper money profits, these have so little real purchasing power that they contribute only a bagatelle toward the new tonnage construction funds of the various lines. New vessels being built for German shipowners are only to an inappreciable extent being paid for out of profits.

"In place of being on Easy Street, as the unthinking public believes, German shipowners, like those of other nations, have been hard put to it to make both ends meet since the present shipping depression began. They have to pay fully as high prices as foreign competitors for fuel, oil, provisions and all other ship supplies, while the cost of maintaining an agency force abroad constitutes a very heavy handicap on account of the mark having fallen to a fraction of its pre-war value. Only as regards wages do the German navigation companies enjoy a temporary advantage, which will cease as soon as the mark is stabilized, when the German seamen will insist on the same rate of pay as prevails on foreign ships. Their compensation is being constantly raised to keep pace with the fall in the value of the mark.

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"In addition to the four vessels it has already in service the North German Lloyd will increase its New York-Bremen passenger fleet by three new units before next spring carrying first, second and third class passengers. These are the *Columbus* of 32,000 tons and the sister ships *Muenchen* and *Stuttgart* of 14,000 tons. Whether we shall place any further vessels on this route will depend on future development. When all the ships now under construction are completed the North German Lloyd will possess the equivalent of one-third of its pre-war tonnage."—*The Nautical Gazette*, 23 June, 1923.

MOTORSHIPS VS. STEAMSHIPS.—

TABLE I.—SHOWING STEAM AND MOTORSHIP TONNAGE COMMENCED DURING QUARTERS ENDING:

| Country | June 30, 1923 | | March 31, 1923 | | December 31, 1922 | | September 30, 1922 | |
|---|---|---|---|---|---|---|---|---|
| | No. | Tonnage | No. | Tonnage | No. | Tonnage | No. | Tonnage |
| United Kingdom: | | | | | | | | |
| Steamers | 52 | 148,123 | 110 | 303,949 | 64 | 199,307 | 30 | 66,908 |
| Motor vessles | 18 | 90,515 | 10 | 48,024 | 5 | 30,260 | 3 | 15,200 |
| Denmark: | | | | | | | | |
| Steamers | 3 | 5,305 | 8 | 11,916 | 2 | 2,060 | 1 | 960 |
| Motor vessels | 1 | 4,350 | 1 | 107 | 4 | 10,610 | 3 | 7,605 |
| France: | | | | | | | | |
| Steamers | 4 | 9,730 | 9 | 48,830 | 2 | 14,800 | 2 | 5,800 |
| Motor vessels | ... | ... | ... | ... | 9 | 3,900 | ... | ... |
| Holland: | | | | | | | | |
| Steamers | ... | ... | 2 | 2,900 | 5 | 4,400 | ... | ... |
| Motor vessels | ... | ... | 2 | 360 | ... | ... | ... | ... |
| Italy: | | | | | | | | |
| Steamers | ... | ... | ... | ... | 2 | 7,300 | ... | ... |
| Motor vessels | ... | ... | ... | ... | ... | ... | ... | ... |
| Japan: | | | | | | | | |
| Steamers | 11 | 11,350 | 5 | 5,530 | 12 | 12,234 | 10 | 16,120 |
| Motor vessels | ... | ... | ... | ... | ... | ... | ... | ... |
| Norway: | | | | | | | | |
| Steamers | 10 | 6,727 | 10 | 5,145 | 3 | 4,744 | 5 | 6,689 |
| Motor vessels | ... | ... | 4 | 725 | ... | ... | ... | ... |
| Sweden: | | | | | | | | |
| Steamers | 1 | 600 | 2 | 2,050 | 1 | 1,450 | 1 | 850 |
| Motor vessels | 2 | 6,000 | 3 | 11,300 | ... | ... | 2 | 13,260 |
| America: | | | | | | | | |
| Steamers | 6 | 16,800 | 18 | 50,756 | 10 | 42,350 | 10 | 48,400 |
| Motor vessels | 3 | 6,000 | 7 | 18,200 | 1 | 1,000 | ... | ... |

This, of course, can hardly be taken as a direct indication that the motorship is beginning to usurp the place of the steamship in the United Kingdom, although it seems certainly to be making good headway. With regard to other countries, Holland and Italy have laid down no motorships recently. Japan, it would seem, has not yet started to build motorships, but her steamship returns show eleven vessels with a total gross tonnage of 11,350; i. e., an average gross tonnage of 1,032. The Swedish returns show that the confidence of that country in motorships is still as strong as ever, although the weight of tonnage laid down is not very great. Norway did not lay down any motor tonnage whatever, and her steamer tonnage shows only an average of just over 600 tons. It will be seen, then, that on the whole the returns for the past quarter are less gratifying than those of the preceding quarter from both the marine engineering and shipbuilding point of view. Table II below summarizes the total tonnage for all countries on which work was commenced during each of the quarters mentioned, and it gives also figures showing the motorship percentage of the total. From this it will be seen that there is an increase in the motor tonnage percentage of exactly the percentage figure for the previous quarter, and that it is, moreover, the highest figure for the past three

TABLE II.—SHOWING PERCENTAGE OF MOTORSHIPS OF TOTAL TONNAGE FOR ALL COUNTRIES

| | QUARTER ENDING | | | |
|---|---|---|---|---|
| | September 30, 1922 | December 31, 1922 | March 31, 1923 | June 30, 1923 |
| | Tons | Tons | Tons | Tons |
| Steam | 148,297 | 291,995 | 443,716 | 202,515 |
| Motor | 36,875 | 41,870 | 79,616 | 107,015 |
| Motorship percentage of Total | 20 | 12.5 | 15.2 | 30.4 |

quarters. This seems to indicate clearly the increasing popularity of the motorship in the world's shipbuilding countries taken as a whole. Furthermore, it is interesting to note, in the résumé of the *Returns*, the statement that "the tonnage of vessels now building in the world which are to be fitted with internal-combustion engines amounts to 387,936 tons, equal to over eighteen per cent of the steam tonnage under construction." There are also under construction in the world for the carriage of oil in bulk thirty-one steamers and motor vessels, each of over 1,000 tons, with a total tonnage of 178,780.—Editorial, *The Marine Engineer and Naval Architect*, August, 1923.

## AERONAUTICS

RESERVE AVIATION.—Acting under the instruction of Assistant Secretary of Navy Roosevelt, the Bureau of Aeronautics has drawn up a comprehensive plan for the expansion of the Naval Aviation Reserve organizations, which will require increased appropriations, it is understood. It is believed that the Service can be made so attractive that 600 aviation pilots can be enrolled in the Reserve force immediately, and that an additional 130 can be trained each year. Recent inquiries instituted by the Department in the thirteen naval districts indicate a ready response on the part of the ex-Service pilots who are eager to enroll for training if Congress will make the provisions that will be asked.

The Bureau of Aeronautics proposes to place a unit in each of the thirteen naval districts and hold the commandant of each district responsible for building up his unit. It is planned to have in each of the thirteen units, ten men with the rating of seaman second class, who would be under training in ground schools, and in flying another ten men taking advanced training with active service units. Under the present appropriation, it has only been possible to maintain the aviation units in New York and Boston with a possible third unit to be established later in the fiscal year. This represents the limit under the appropriation for the present fiscal year.—E. B. Johns in *Army and Navy Journal,* 11 August, 1923.

AERIAL BOMBARDMENT MANEUVERS WITH WARSHIPS.—The general plan for the sinking of the two obsolete seacraft contemplates action against one of the battleships with 1,100 lb. bombs by a service flight of airplanes and it is intended to employ 2,000 lb. bombs in the sinking of the second battleship. The Army Ordnance has developed a 4,000 lb. aerial bomb containing over a ton of explosives but these are still in the experimental stage and therefore will not be used in these tests. The acute shortage of personnel, particular flying officers in the Air Service and the lack of equipment will not permit the Bombardment Group to operate at full strength. It is expected, however, that two squadrons of approximately six airplanes each will be available for these maneuvers. Several of the pilots and bombers assigned to this duty have been ordered to Langley Field to augment the small force now at that station and the majority of those participating are crack pilots and bombers with war time training and experience and who took part in the bombing of the former German battleship in the summer of 1921.

The actual time during the day at which these battleships will be sunk will be determined later and will depend to a great extent on weather conditions. Prior to the final sinking of these vessels, night maneuvers will be conducted involving the use of pyrotechnics and possibly phosphorous bombs. In connection with the bombing, it is also intended to employ smoke screens laid by airplanes. Two Martin Bombers are at present equipped with tank and nozzle apparatus for spraying purposes. Recent tests with smoke clouds conducted at Aberdeen Proving Ground, Md., sprayed from an airplane indicates a possible tactical use of smoke screens employed by airplanes in connection with the bombardment of battleships. A sufficient amount of chemicals can be carried by one airplane, so the Chemical Warfare Service states, to lay a smoke screen about 1,000 feet deep and approximately three miles long. A demonstration will, therefore, be conducted during these exercises to determine the feasibility of bombardment airplanes choosing their own altitudes for delivering an attack against naval craft by maneuvering under cover of such a smoke screen. The successful employment of such a smoke cloud to obscure the aerial view from seacraft and allow the maneuvering of airplanes would give valuable data in connection with the employment of anti-aircraft and indicates the possibility of bombardment airplanes operating at the most effective altitudes under cover of such a smoke cloud.

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The airplanes to be used during these exercises are Martin Bombers equipped with two 400 hp. Liberty motors, similar to those used in the bombing tests in the summer of 1921. These airplanes are capable of carrying a load of over 2,000 pounds of bombs in addition to their regular military load and will bomb from altitudes above 6,000 feet. For the purpose of bombing at higher altitudes, from 15,000 to 20,000 feet, one flight of these airplanes will be equipped with superchargers, to enable them to reach higher altitudes with heavy loads.

In order that these battleships may be sunk in compliance with the terms of the Naval Treaty and so that they will not be a menace to navigation they must be sunk in fifty fathoms of water. The fifty fathom curve lies fifty miles east of Cape Charles and about eighty miles east of Langley Field. This is in the general vicinity in which the bombardment tests were conducted against the former German battle cruisers in the summer of 1921, but this location is so far from shore that considerable over water flying would be necessary which would increase the hazard for the pilots and bombers flying the airplanes. This is considered unnecessary in view of the fact that the fifty fathom curve lies only twenty-two miles off shore east of Cape Hatteras, and it is therefore contemplated sinking the battleships in this vicinity where they will be placed at their final anchorage after being towed from Boston.

As an additional precaution against possible accident and for patroling and observing purposes, it is expected that five or six small seagoing craft such as mine planters or vessels of a similar type will be stationed at intervals between Cape Hatteras and the target. The Army Air Service is also taking action to procure a larger sized vessel if possible for use of observers and other officials who may desire to view the exercises. Parachutes and Kapok vests will be worn by the crew of each airplane as an additional precaution in case of forced landings.—*Aviation*, 13 August, 1922.

British Interest in American Engine Test.—American engineering progress in aircraft engines has attracted considerable attention abroad. The 300-hour engine test inaugurated by the Navy over a year ago remains today the most severe test to which aero engines are subjected throughout the world. Several articles have recently appeared in British aircraft journals, the following, taken from *Aeroplane* of June 6, 1923, being typical:

"The point, however, is that whereas in this country the official type-tests call for only fifty hours running, America has decided that a much more severe test is desirable and can be fulfilled, and in adopting this more severe test it has set itself to provide engines of a higher standard of reliability than can be certainly secured under present British regulations.

"It is interesting to observe that this move has been initiated by the American Naval Air Service. There is not the least doubt that the necessity for engine reliability shows itself rather more acutely in the case of oversea operation than it does in ordinary overland flying, and it is to be noted that the American Bureau of Aeronautics has shown signs that it is willing to some extent to accept engines of somewhat heavier build than are usually considered as desirable for Army service, provided that a commensurate increase in reliability is obtained in return for additional weight.

"But in the case of the Wright E-4 engine a distinctly light engine has stood up to a surprisingly heavy test. The European Hispano of the same bore and stroke is rated at 180 H. P. and 1,800 R. P. M. The E-4 averaged 205 H. P. during 300 hours on a dry weight of 480 pounds—which is by no means heavy for a relatively low powered engine.

"It would appear that it is very distinctly up to the British engine makers and the British Air Ministry to see that in this vital matter we are not left behind by America—as we have already been in respect to aeroplane performance."—*International Aeronautics*, August, 1923.

Bad Valve Sank Balloon.—Board of Investigation Reports on Craft that Carried Lieutenants to Death.—Lakehurst, N. J., July 17.—A board of investigation reported today that the Navy balloon in which Lieutenants T. B. Null and L. J. Roth lost their lives during the balloon race which

started from Indianapolis July 4, contained a faulty valve on the gas bag. This valve once opened, the report said, failed to close properly, releasing the gas in the bag and causing the balloon to fall into Lake Erie where it was later discovered by fishermen. The balloon was received at the Naval Air Station here yesterday and the investigation begun immediately.—*Boston Transcript*, 17 July, 1923.

FUTURE OF THE WORLD'S AVIATION.—London, July 3.—The International Air Congress, which held its sessions at the Institution of Civil Engineers the last two weeks, adopted a series of resolutions of prime importance to the world of aviation. These included:

A request to the International Conference on Aerial Navigation to evolve some uniform scheme of posting the weather forecasts in all air stations, and of compiling a leaflet of essential information for pilots.

The recommendation that an international conference should be held as soon as possible, with delegates appointed by their respective Governments, to study and define the general principles of private international law relating to the air, and to submit propositions of law for ratification by the various nations concerned.

An invitation to the international commission for the standardization of aircraft materials and component parts.

And an invitation to the postal authorities of the various European Governments to devise air transport time-tables which would best suit them for the carriage of mails.

The pooling and comparison of results of experiments in all aerodynamic laboratories was also recommended, and the respective Governments were urged, in the interests of aerial navigation, to unite in subsidizing the trans-continental air services as speedily as possible. The medical section of the congress affirmed that from the evidence now accumulated, the physical condition of pilots who have flown for years, given reasonable flying hours, does not deteriorate more rapidly than in other employments, and that the data and curves already available indicate that those pilots maintain a condition above the normal for their age.—*Boston Transcript*, 16 July, 1923.

EXPECT TO WIN COWES CUP.—Washington, July 25.—What are expected to be the fastest seaplanes in the world have just been tested. They are two of four navy planes that are to represent this country in the Schneider Cup Seaplane Race to be held at Cowes, England, on September 28.

The *NW-2* plane was tested at the naval aircraft factory, Philadelphia, and the *CR-3* was tested at Garden City, Port Washington, L. I.

The *CR-3* is an adoption of the Curtis Navy racer which has been standard design for racing and has led the world in performance since the first of the type won the 1921 Pulitzer race. This type forms the basis of a fleet of Navy fighting planes which the Navy would place in the air in the eventuality of war.

The *NW* type is a small biplane powered with a Wright T engine of 700 horsepower, and is the highest powered single motored seaplane ever built. The first plane of this type was entered in the Pulitzer race last year as the "Mystery Ship." At this time she was a new development with an engine which had never been in the air before. She was practically taken from the construction yard and sent into the air in the race. In the last year she has been improved and redesigned in many particulars, which adapt her to Navy needs not only as a racing plane but as a basis for the development of swift fighting planes, the infantry of the air.

France, Italy and England are bending every effort and are going to limits of design never before attempted in an effort to turn out seaworthy

types of fast seaplanes capable of competing with those of the United States Navy.

The types of aircraft which will represent the United States Navy in this event and which are viewed with such keen interest on the part of international competitors will demonstrate that although the United States has not declared itself as a participant in the race for the supremacy in the air, nevertheless those charged with the development of naval aeronautics are fully abreast of world progress in this important development and are ready to expand on a basis of design superior to any in the world.

Although every confidence is felt that the Navy representatives will give a good account of themselves the result is by no means a certainty. It is known that England is making strenuous efforts to insure that the prestige that attaches to the winning of this aerial classic will not be wrested from her, while Italy, who lost to England in the Schneider Cup race last year can be counted upon to be a formidable contender.

The Navy entries are: Pilots, Lieutenant F. W. Wead, U. S. N., in charge; Lietenant Rutledge Irvine, U. S. N., Lieutenant A. W. Gorton, U. S. N., Lieutenant D. Rittenhouse, U. S. N. The planes are *NW-2*, two *CR-3s*, and *TR-3*.—*Boston Transcript*, 25 July, 1923.

No Air Parley, Says Baldwin.—Premier Baldwin, replying to a question in the House of Commons on July 5, said the United States had indicated no willingness to call a conference for the limitation of air forces.

The Prime Minister said:

"In my view it would be premature to hope for the successful issue of such a conference until a number of outstanding matters which remain unsettled in Europe are settled."—*International Aeronautics*, August, 1923.

Vibration Beat Maughan.—Rock Springs, Wyo., July 20.—Vibration caused the leaks in the oil cooler of Lieutenant Russell L. Maughan's Army pursuit plane and necessitated the abandonment for a second time of his attempt to cross the continent in a single day, according to C. S. Krebs, manager of the United States air mail field here.

"There are several small cracks in the cooler, apparently the result of the continued vibration of the motor, during the long flight," Mr. Krebs said after an examination of the plane which was forced down last night after Maughan had completed 1925 miles of his trip.

"It will require about three or four hours to repair the leak, owing to the fact that it will be necessary to remove the cooler from the plane and solder it.

"The leak in the cooler is in another place than that soldered at Cheyenne yesterday," he said. "The first leak, which delaved Maughan about forty minutes, had not been reopened when it reached here."

The oil cooler is a honey-combed container through which the oil circulates under pressure and the strain upon it, during a protracted flight, is great. One of Maughan's personal mechanics is en route here from Cheyenne to assist in repairing the plane, according to information received at the air mail field.

Maughan came down with oil pouring from the tank in bucketsful and nauseating fumes engulfed the machine and weakened its pilot.—*Boston Transcript*, 23 July, 1923.

Another Round the World Flight.—A round the world flight is being planned for next spring by Captain Sacadura Cabral and Admiral Gago Coutinho of the Portuguese Navy, who achieved fame by their transatlantic flight from Lisbon to Rio de Janeiro. The two airmen plan to circle the globe in three different types of planes, each type being specially

adapted to the conditions prevailing on the three main divisions of their projected itinerary: Lisbon-Japan, Japan-Newfoundland, and Newfoundland-Lisbon.

The total distance to be covered is approximately 19,500 nautical miles, and the main stopping points are Lisbon, Crete, Aleppo, Delhi, Calcutta, Rangoon, Bangkok, Shanghai, Yokohama, Petropavlovsk, Vancouver, Winnipeg, Quebec, the Azores, Lisbon.—*Aviation*, 6 August, 1923.

AMUNDSEN'S PLANE TOO LIGHT.—San Francisco, July 23.—Failure of Roald Amundsen, explorer, to carry out his plans for a flight across the North Pole this year was due to his plane being too light, according to an unnamed member of the Amundsen party now aboard the trading ship *Arctic* at Wainwright, Alaska, it was stated in a wireless message received by the ship's owners.

This man, an aviator, said Amundsen planned to attempt the transpolar flight next year in another plane.—*Boston Transcript*, 23 July, 1923.

NAVY AIRPLANES AT CANAL ZONE.—Three *JN-6* airplanes, assigned to the Naval Air Station, Coco Solo, C. Z., have arrived and are being placed in operation immediately for the purpose of testing the new landing field that has been put in commission at the Air Station, and to determine what, if any, improvements or additions are necessary. Considerable enginering difficulty was experienced in making this field due to the swampy and coral formations of the terrain. It is hoped that this field will be suitable as a base for land planes operating with the fleet.—*Aviation*, 23 July, 1923.

AN AIRSHIP SLIDE RULE.—Report No. 160 of the National Advisory Committee for Aeronautics, by E. R. Weaver and S. F. Pickering, describes an airship slide rule developed by the Gas-Chemistry Section of the Bureau of Standards, at the request of the Bureau of Engineering of the Navy Department. The development of this slide rule was requested by the Navy because of the successful results which had been reported of the Scott-Teed rule which had been developed and used by the British naval air service. It is intended primarily to give rapid solutions of a few problems of frequent occurrence in airship navigation, but it can be used to advantage in solving a great veriety of problems, involving volumes, lifting powers, temperatures, pressures, altitudes, and the purity of the balloon gas.

The rule is graduated to read directly in the units actually used in making observations, constants and conversion factors being taken care of by the length and location of the scales. In order to simplify as much as possible the manipulation of the rule, absolute accuracy has in some cases been sacrificed to convenience. Generally this has been necessary only in those cases in which the data upon which the computations will be based are not subject to accurate observation.

It is thought that with this rule practically any problem likely to arise in this class of work can be readily solved after the user has become familiar with the operation of the rule; and that the solution will in most cases, be as accurate as the data warrant.

A copy of Report No. 160 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.—*Aviation*, 6 August, 1923.

HELICOPTERS.—Two events that have happened in France during the past week denote that some headway is being made in the construction of helicopters. The Oemichen apparatus, built at the Peugeot works at Valentigny, has flown for more than five minutes at a height of ten feet,

and having satisfied the conditions of the official test has been purchased by the French Government. The Pescara machine has not done so well, although it has flown for 200 m. just clear of the ground. This performance is better than anything it has done so far, and it has to undergo official trials shortly. The confidence at one time shown in the future of the helicopter has waned considerably in view of the complicated character of the machines so far produced and of their low mechanical efficiency arising from the losses in the transmission of power to the lifting and propulsive planes through bevel and other gearing; but for naval purposes the helicopter is held in France to have great utility, and the State is devoting quite a large sum of money to its development.—*Engineer*, 13 July, 1923.

French Helicopter Flies 650 Meters.—Paris, July 21.—All records made hitherto with a helicopter were broken this morning, when M. Pescara, the French inventor, made a flight of 650 meters, landing in the circle ten meters in diameter from which he arose.

Later Pescara made a flight in a straight line of 450 meters. He was forced to descend because of the dust which his propellers raised.

On Monday morning Pescara will try before officials of the Aero Club de France to make a circular flight of a kilometer.—*New York Times*, 22 July, 1923.

The Brennan Helicopter.—According to the *London Daily News*, the helicopter constructed by Louis Brennan in a recent test hovered for nearly a quarter of an hour at a height of 20 feet, remaining at all times perfectly under control. The machine is said to have carried passengers and a military load of 1,000 pounds. The test was made in the large airship shed at South Farnborough, where the helicopter was assembled. The utmost secrecy surrounded the work, an armed guard being stationed night and day for months in front of the shed.

Mr. Brennan, who is barred by the British government from participating in the helicopter competition organized by the Air Ministry, for which prizes of £50,000 are offered, will, it is said now devote himself to the question of horizontal and vertical flight. From newspaper accounts it appears that the Brennan helicopter has yet to make a flight in free air, where atmospheric conditions are not as undisturbed as in a closed airship shed.—*Aviation*, 23 July, 1923.

Aerial Transport.—In these days of aircraft consideration and the linking of civil and defense needs it is interesting to note a marine proposal which has been dealt with by Mr. Cecil Malone, Sir Eustace D'Eyncourt, Mr. J. H. Narbeth and others. Briefly, the scheme consists in arranging for aeroplanes to fly off the great liners before they reach their destination, thus saving a day or two, say, in the transatlantic route. An obvious extension of this principle would be to save a further day at the beginning of the voyage in a similar manner. The progress of directional wireless has made this a practical proposition.—*Army, Navy and Air Force Gazette*, 21 July, 1923.

Growth of Aerial Photography.—Underwood and Underwood, one of the best known and largest photographic firms, have started an aerial photographic department and are prepared to execute anywhere in the world both oblique and mapping work on a thoroughly businesslike basis.

Associated with Underwood and Underwood in this work is Hamilton Maxwell, who has had wide experience in aeronautical surveying and mapping. The Company is now engaged on a contract for surveying

eighty odd square miles surrounding Rochester, N. Y., for the Rochester Telephone Company. Mr. Maxwell had a large part in convincing Underwood and Underwood that the time was ripe for them to open a department for aerial photography.—*Aviation*, 6 August, 1923.

PHOTOGRAPHIC LABORATORY ON "ZR1."—A photographic laboratory is being installed on the *ZR1*, the big Navy airship now nearly completed at the Naval Air Station at Lakehurst, N. J. This laboratory will be equipped for developing and printing still photographs and motion picture film and will be located in the keel of the ship, where supplies and quarters for the crew are situated.

By its use photographs and motion picture film taken in flight can be finished while the ship is still in the air, ready for distribution upon landing. In the case of an extended flight of some days the completed photographs can be dropped over the side by means of parachutes while passing over cities or pre-arranged points. This is a revolution in speeding up the publication of pictorial records of aerial flights, enabling the public to look at the remarkable views as seen from an airship a few hours after they have been witnessed by the passengers on the airship.

In time of war this will be of the greatest military value, greatly increasing the value of airship scouting at sea with the fleet. An airship on important scouting work, passing over enemy formations at sea or fortifications will take pictures, both still and moving, and develop them ready for inspection as soon as a friendly vessel or station is reached or even passed over. The developed pictures will also be of great value to the airship commander, enabling him to study in flight, the area passed over, facilitating accurate and complete radio messages to his base, either afloat or ashore.—*Aviation*, 13 August, 1923.

SEVEN MILES UP.—Sadi Lecointe, French airman, has been 923 feet 6 inches farther from earth than anyone that ever lived on earth. After elaborate training preparations (*Time*, July 23) he broke Lieutenant Macready's (U. S. A.) world's altitude flying record above Villacoublay, France.

Macready's mark was 34,509.5 feet. Lecointe rose 35,432 feet (6.773 miles). Mt. Everest, earth's highest peak, measures 29,002 feet. In 1901 two Germans ascended 34,500 feet in a balloon, a standing record.

Lecointe climbed for an hour and twenty minutes in a Nieuport-Delace plane with Hispano motor 454. It took him thirty-five minutes to coast back to earth. He wore electric-heated fur clothing, breathed from an oxygen bottle above 5,000 meters, used benzol fuel for the first 6,000 meters and above that gasoline. His thermometer broke at forty degrees below zero, Fahrenheit, and a broken oxygen bottle robbed him of one or two thousand meters more. He said: "If the weather's fair I may try it again."—*Time*, 13 August, 1923.

## ENGINEERING

PRESSURE AT 3,200 POUNDS.—An experimental superpressure steam plant now nearing completion, designed by the Benson Engineering Company of London and soon to be erected in the works of the English Electric Company at Rugby, England, is to employ a pressure of 3,200 pounds per square inch and will have a temperature of 706 degrees F. The heating elements are of very small section and have no steam drums or chambers. Steam will be generated at a pressure above that named, then throttled to 1,500 pounds and, after being superheated to 788 degrees F., will be passed through a high-pressure turbine exhausting at 200 pounds per square inch.

The exhaust of the high-pressure turbine is to be reheated to 662 degrees F. and then expanded in a standard normal-pressure turbine to 29-inch vacuum.

The builders of the plant predict not only that it will consume about 28 per cent less fuel than a high-grade plant of the same capacity operating at 250 pounds pressure, but that it will also be cheaper to build and maintain. The plant is declared to be equivalent to a 1,000-kw. commercial plant. The great jump from 1,500 pounds pressure, the highest previously employed, to 3,200 pounds is due entirely to the fact that at any pressure below 3,200 pounds latent heat must necessarily be added, with consequent troubles from boiling and priming.—*Electrical World*, 9 June, 1923.

First Mercury Boiler Is Now Installed.—The mercury boiler to be used by the Hartford Electric Light Company at its Dutch Point plant is in place and preliminary operation will, it is announced, start within a few weeks. This installation has attracted much interest because of its novel character. The boiler is installed outside the original station. Oil is to be used as a fuel. There will be approximately fifteen tons of mercury used in the installation, and every precaution against leakage in the form of vapor will be taken.

It would not be possible to develop and operate this plant were it not for the electric and acetylene welding processes. Mercury amalgamates with copper, and as the temperatures used are so much higher than steam temperatures, there is no form of fiber gasket which will stand the temperature. The pressure used as compared with steam is extremely low. The maximum on this boiler will not be in excess of 35 pounds by gage.

The mercury boiler itself is built up of a large number of tubes with the edges welded together at the bottom. These tubes are hexagonal for about two-thirds of their length and circular at the top. The tops of the tubes are expanded into a plate and welded. All pipe connections from the boiler to the turbine are also welded. The mercury vapor passes normally through the nozzles to the wheel and is governed in approximately the same manner as any other revolving apparatus. In case of change of load on the turbine, the governor does not close the valve as in ordinary cases, but diverts the proper amount of vapor from the nozzles direct from the boiler to the condenser. This operation requires a damper rather than a tight-fitting valve. On account of the high temperatures it would not be practicable to use a valve, as at the high temperature of the vapor the steel is liable to warp.—*Electrical World*, 9 June, 1923.

New Theory of Condenser Corrosion Suggests Remedy.—Research work recently carried on by the three British organizations—the Department of Industrial and Scientific Research, the British Electrical and Allied Manufacturers' Association and the Brass and Copper Tube Association—has not only brought out much new information regarding one particularly serious type of condenser-tube corrosion, but has apparently pointed the way to a simple remedy. The particular type of corrosion considered was that due to undissolved air entangled in large quantities in sea water or other water containing a high percentage of salt. The corrosion attacks only the tubes in certain plate areas and is confined almost entirely to the first three or four feet of the tubes and to the portions more than thirteen feet from the inlet (in the case of very long tubes). The principal remedy suggested is to keep the tubes for a week in sea water at 100 degrees F. before putting them into regular service. During this preliminary treatment the water should be stagnant or only slowly moving.

The following digest of the research work is based upon the report of Guy D. Bengough in the July 6 issue of *The Engineer* (London).

The investigation has been carried out under the direction of the Corrosion Research Committee of the Institute of Metals, and a voluminous report of the work will soon be presented to one of the engineering societies interested in the matter. The investigation was confined entirely to the corrosion caused by the presence of entangled air in the circulating water (sea water or salty water).

This variety of corrosion is particularly serious because it can cause tube failure in a few weeks. The rapidity of the action seems to be little affected by the composition of the tubes. The corrosion is characterized by being mainly located in the first three or four feet of the tubes and in the portion more than thirteen feet from the entrance, and by being free from the corrosion products, so that it looks very much like ordinary erosion by water flow. Other characteristics are that the corrosion is limited almost entirely to the tubes in certain restricted areas of the plates, and that electrolytic protection does not stop it.

In the writer's experience tubes have failed, due to this cause, in as little as seventeen days. Several instances have occurred of failures within six weeks, and failures within a year have recently become fairly common. Tubes that have lasted more than two years in a condenser have rarely shown all the characteristics of the action outlined. Lowered temperatures and increased water velocities both seem to increase this corrosive effect, which is therefore particularly serious in modern high-vacuum plants.

Extensive experiments seem to demonstrate pretty well that the cause of this type of corrosion lies not so much in the composition of the tube as in the conditions to which it is exposed. By observations of glass tubes and by subjecting condenser-tube material to the flow of sea water containing various quantities of entrained air bubbles, it has been conclusively shown that the corrosion near the entrance of a tube is due to the water entering at such an angle or in such a turbulent manner that the bubbles were thrown against the side of the tube. As the water flows along the tube, the bubbles gradually work toward the center, whereupon the corrosion is greatly reduced. At the same time there is a continual reduction in the size of the bubbles, which factor in turn increases the corrosion again after about thirteen feet of the tube has been traversed.

It should be noted that this type of corrosion is not due to the *dissolved* air that enters so often into corrosion discussions, but to a large amount of *entrained air* found in foaming sea water. The three most important factors seem to be the amount of this air, its state of subdivision (the finer the bubbles the worse is the corrosion) and the manner in which the bubbles impinge on the side of the tubes.

The action seems to consist mainly in the removing of the protective scale. One obvious way to reduce this difficulty is to eliminate air leaks in the circulating-water suction line.

It is also characteristic of this kind of corrosion that it affects the tubes in certain sections of the tube sheet, so that tubes in these sections may have to be replaced frequently, while those in other sections are practically unaffected. This is doubtless due to the fact that the flow distribution leads the air bubbles mainly to the tubes in the affected sections. When such troubles occur, it is important to keep an accurate record of tube replacements, showing the exact location of each tube, preferably on a large drawing of the tube sheet.

In replacing tubes in the affected section, much benefit may be expected from the use of tubes that have already acquired a protective coating. These may be obtained by transfer from the unaffected part of the condenser or by giving the new tubes a special treatment for a week in stag-

nant sea water at 100 degrees F. In either case a protective film is formed.—*Power*, 7 August, 1923.

LATEST NAVY EVAPORATOR PRACTICE.—Until recently the evaporators in the Navy were operated by high-pressure steam. As early as 1912 experiments were made with other types of evaporators, but it was not until 1922 that the type to be described was adopted as standard for naval vessels. This may be briefly described as a low-pressure multiple-effect film-type evaporator based on the patents of S. Morris Lillie, with modifications designed by the Navy Bureau of Enginering.

The two principal reasons for changing to the low-pressure type were the difficulty due to hard scales at high temperatures and the desirability of making use of the large amount of exhaust steam available from marine auxiliaries. The new type of evaporator, in double, triple or quadruple effect, is projected for all ships of the Navy, as funds and time permit.

These evaporators will use low-pressure steam and operate with a 26- to 27-inch vacuum on the last effect. In the film evaporator the tubes are not submerged, but the water drips down over them from a perforated diaphragm above. The raw sea water entering the system is sent through all the effects in series, finally being discharged overboard with a salinity two and one-half times that of normal sea water. A circulating pump on each effect takes water from the bottom of the shell, pumping part of it to the next effect and recirculating the remainder to the perforated plate above the tubes. In falling like rain over the tube nest, part of each drop evaporates, and the rest of the drop washes the salt remaining from the evaporation off the tubes down to the bottom of the shell. The water level in the bottom of the shell is kept just above the lowest row of tubes.

Navy experience shows that this type of evaporator not only permits the use of all available auxiliary exhaust steam, but also obviates deposits of sulphite scale and greatly reduces the formation of carbonate scale. By using a high vacuum the temperature range between the entering steam and the last-effect vapor is large, even with initial pressures below 10-pound gage.

When rejecting the brine from the last effect with a concentration about two and one-half times normal, the following results may be expected.

| Number of Effects | Pounds of Distilled Water per Pound of Steam |
|---|---|
| Single | 0.95 |
| Double | 1.60 |
| Triple | 2.50 |
| Quadruple | 3.30 |

These results are conditioned, among other things, upon heating the feed water as much as possible with the plant's own available heat. The method of accomplishing this is one of the improvements made by the Navy Department of Engineering. Circulating water for the distilling condensers is taken from the sea, sent to the condensers and discharged overboard, the raw feed being taken from the warm discharge. On its way to the first effect the feed water passes through two vapor heaters located between effects and then through one coil-drain heater on the first effect.

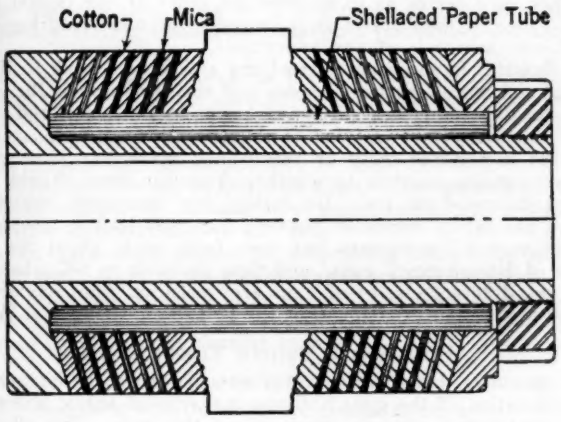
In each effect one tube header is fixed while the other is floating with a special compartment at the end from which the air is drawn through a 1-inch brass pipe to an air pump. The sump at the bottom of each evaporator shell is provided with a horizontal screen, so that pieces of scale will not cause any trouble.

Computations show an important gain in performance by the use of vapor heaters and drain heaters as indicated by the following table for a triple-effect evaporator:

| | Water per Lb. of Steam |
|---|---|
| No heating | 1.90 |
| Coil drain heaters only | 2.13 |
| Coil drain and vapor heaters | 2.50 |

The gain obtained comes, of course, from the added evaporation in the first effect. The vapor made in the first effect produces nearly twice as much more when it can be sent along to the second and third effects. Without heaters or with coil-drain heaters alone the evaporation in the second effect is greater than in the first and that in the third effect greater than in the second. With all the heaters the greatest evaporation is in the first effect and the least in the third. This change in distribution not only increases the capacity, but also improves the purity of the water by reducing the load on the third effect, and hence its tendency to prime.—*Power*, 31 July, 1923.

A 12,000-Volt Direct-Current Generator.—S. R. Bergman described the principles underlying the successful design and manufacture of a high-voltage direct-current generator. He attributed the success of the design to its being based on or built around commutation. A distributed field




12,000-Volt Commutator

winding as well as a distributed armature winding made possible successful commutation, even though the voltage between bars is high. The principal mechanical problem was to build the commutator. A special construction, as shown in the accompanying illustration, made this possible. The principal use of such a machine is to provide the plate voltage of large vacuum tubes.—*Electrical World*, 7 July, 1923.

## ORDNANCE

### GUN RANGE OF CAPITAL FIGHTING SHIPS

"Shall We Grant Range Superiority," Asks Captain Evans, "to the Big Guns of a Foreign Navy?"—Captain Waldo Evans in *Chicago Commerce*.—"If I were the manager of Dempsey and an article should appear

in a paper favorable to the interests of Gibbons written by one of his backers, giving friendly advice as to the management of Dempsey, I should be disposed to regard that advice with some suspicion. I should suspect that the backer of Gibbons was giving the advice in the hope that through some of its reactions it might increase Gibbons' chance of winning in the coming contest.

### British Subject as Naval Adviser

"I am somewhat influenced in a similar way upon reading the article by Mr. Hector C. Bywater, a British subject and naval writer of some prominence, who owes his first loyalty to the British Empire and of course to the interest of the British Fleet. This article appears in the *Scientific American* for July, 1923. As to Mr. Bywater's article there seems to be comparatively little to object to in the article. He states some interesting facts in an interesting way but when he comes to the real meat in the cocoanut, he dismisses it with a wave of the hand in the following words:

"'Little need be said here as to the actual military value of what may be called super-range in ships' artillery. In theory, hitting is possible up to the extreme limit of range; in practice, the percentage of hits obtained at anything above, say, 24,000 yards, on a target moving at high speed and on a varying course, would probably be nil.'

"This, as it happens, is the particular point which needs to be considered by our naval officers and by Congress and by all those in authority over the Navy when they decide as to whether the older of our capital ships shall have the range of their turret guns increased or not. Nothing else in the so-called controversy is of any importance.

"Mr. Bywater in the early part of the article goes back to the days of Trafalgar and traces the use of guns and the elevation of the guns down through to the time when airplanes began to be considered for use in spotting the fall of salvos, that is the present time. His comments on gunnery of a hundred, fifty or twenty-five years ago have no bearing whatever upon the issue as to whether American guns should have their elevations increased or not. He makes one statement, however, in his review of the earlier forms of gunnery that may lead to a wrong conclusion. He says: 'No mystery has even been made about the maximum elevation of British naval guns,' and then proceeds to tell what the elevations of the different classes of guns are, repeating what has already been furnished to our state department by the British ambassador at Washington.

### Elevation of British Turret Guns

"The statement that there is no mystery appears to be intended to mean that the elevation of the guns has been a matter of public knowledge both in this country and abroad. Such is not the case. The efforts of our officers to ascertain the elevation of British turret guns were unsuccessful until the categorical information of the British ambassador became available. Officers of our Navy had made inquiries and had received replies from which they concluded that the elevation of the British guns were considerably in excess of the elevation of American guns. Of course the fact that the exact data was not furnished to our officers is no cause for grievance on the part of Americans. Information of this character is regarded as secret ordinarily by nearly all naval powers and it is perfectly correct to guard that information from all foreigners.

"Our office of naval intelligence, having accepted and analyzed the best available information was led to believe that the ranges of British battleships were considerably greater than what they were later said to be by the British ambassador. As Mr. Bywater states, the Navy Department and the State Department were very prompt to accept the authoritative information furnished by the British ambassador on this subject.

"That brings the question down to the present: the British guns with certain ranges known to our officers and the American guns with ranges also known to our officers. An analysis of the two tables available in Mr. Bywater's article indicates that America has thirteen battleships outranged by the bulk of the British Fleet by from one to two miles. The question at issue, is, shall we accept Mr. Bywater's advice and continue with the handicap of one to two miles in range for many of our ships, or shall we act in our own interest as we see it and increase the range of our battleships so that they shall, in no case, be inferior to British ships in this respect? We can arrive at this particular decision perhaps best by considering some concrete cases of possible naval action.

### Standing Off Your Enemy

"Case I. Suppose six of our 14-inch guns ships that have a range, according to the table, of 20,000 yards should fall in at sea with six 15-inch gun battleships of the British of about the same date of construction, having a range of 24,300 yards according to the table. It is perfectly plain to any naval officer, who has studied the battle of the Falkland Islands and followed Admiral Sturdee's tactics there, that the British wouldn't close to a range on our ships where our ships could fight until the circumstances of the battle made that seems to be the most advantageous thing for the British to do. They might be expected to remain just beyond our 20,000 yards range and fire their guns of longer range perhaps until the battle was over, thus, achieving a bloodless victory for themselves and annihilating defeat for us.

"Someone may say that it would be perfectly easy for our ships to alter the range and to close with the enemy. The Germans tried that repeatedly on Admiral Sturdee at Falkland Islands and Admiral Sturdee simply drew away because he had the faster fleet as well as the longer range guns. In other words, he held the Germans where he could fire at them with effect and where they could not fire at him with effect. That would be the answer of the British admiral in the case now under consideration because his ships are faster than our ships would be.

"The public very often makes the assumption that fleets will always fight concentrated. That is the aim of strategists and tacticians, but concentration is often impossible to bring about at the critical time so that the case here discussed is not at all an impossible or a visionary one. It is one quite likely to have its exact parallel in war.

### If the Fleets Were in Action

"Case II. Assuming that the fleets are concentrated, what would be the effect of the superiority in range of the British ships. The effect would be exactly similar to that above discussed, provided the weather permitted long range firing and provided aircraft were available for controlling the fire of the ships, except that in the earliest stages of the battle some of the American ships, according to the table, would be able to begin firing effectively before the British ships did. If this period of the battle could be lengthened at will by the American admiral, it would be a distinct advantage but as the speed of the American Fleet is inferior to the speed of the British Fleet, the American admiral would not be able to choose the range at which his ships would fire, if his choice did not coincide with the desires of the British admiral.

"In other words, if, unhappily, the American and British Fleets tabulated in Mr. Bywater's article, should come together in battle, the British Fleet would have within its power to pass through the battle range at which American gunnery would have the advantage and attain the range at which British gunnery would have the advantage and it would have the

further power to maintain that range indefinitely because of its superior speed. If the range of the guns of the American Fleet is increased, as planned by American naval officers, there will be no special range at which the British Fleet would have a gunnery advantage over the American Fleet.

"This condition is one which the American naval officer seeks and it is putting it very mildly to say that whenever he sees American papers and American editorials in those papers hostile to the attainment of such a position by the American Navy, he is nonplussed and wholly unable to understand the kind of patriotism that wishes the instruments of war of a foreign though friendly power to be superior to the instruments of war of the United States Navy.

"The above outlines somewhat the real question which Mr. Bywater brushes aside by: 'Little need be said here as to the actual military value, etc.' I know of no feeling more comfortable in war than to see one's own shell hitting ships of an enemy and at the same time seeing the enemy's shell falling far short of our own ships. Do we wish to place superiority of range of capital ships' guns in the hands of a foreign navy?

"Mr. Bywater explains that increasing the elevation of turret guns has several drawbacks and he enumerates them as a basis for his implied advice to the American public that American naval officers do not know what they are asking for when they ask for increased elevation. The drawbacks, which he enumerates, it is needless to say, have been carefully considered in their every aspect and no one of them has anything like the complexion which Mr. Bywater implies they have.

"Mr. Bywater says: The popular notion that increased elevation gives much longer range is illusory. For instance, if the *Hood's* guns were converted to forty degrees, the gain in range would not be more than 4,000 yards.

"Please note that Mr. Bywater is dealing with the question of the *Hood's* guns from thirty degrees to forty degrees, which is entirely beside the question. American naval officers are asking for the elevation of their guns from fifteen degrees to thirty degrees but the statement that such a change of elevation does not give a much greater range is not borne out by the facts. For instance to change the elevation of a 14-inch gun from fifteen degrees to thirty degrees would increase its range over five miles. Now let us consider exactly what that means. Suppose there were two ships of exactly the same kind; one with a fifteen-degree elevation and the other with a thirty-degree elevation and that these two ships were to fight each other single-handed but using airplane spotters. From the time that action began for the longer range ship until the shorter range ship had closed to battle range would probably be not less than three quarters of an hour. In that time the longer range ship would be perfectly well able to fire 600 carefully aimed and ranged 14-inch projectiles carrying high explosive charges at the shorter ranged ship without the shorter ranged ship being able to fire a single effective shot in return.

"Allowing for two per cent of hits the shorter range ship would have been struck twelve times by high explosive, armor piercing projectiles, with at least an even chance of having been sunk without ever having been able to fire in return. If, in addition, one gives to the longer range ship the higher speed, the battle could be fought to a finish with effective shots fired by no other than the longer range ship. This condition is one which Mr. Bywater's article simply advises us, as Americans, to be one of no importance and which we can afford to continue.

"There seems to be prevalent an idea that the limitation of armament conference did away with all kinds of competition. This, of course, isn't true. The American Navy today, as well as all foreign navies is engaged in constant competition. Its every drill or exercise that it engages in is

for the sole purpose of attaining a higher degree of efficiency than existed before and particularly for developing an efficiency greater than that of any of its possible enemies. This striving for efficiency is not limited solely to the training of individuals but extends to the development of material. If we can find any possible way of making our guns more effective, our engines more efficient, our radio communication of greater range and reliability, our internal communication system of greater reliability and certainty of action; if we can, by any possibility, develop our fleet into a more efficient team, ready to deliver concentrated blows both in time and in space, it would be the manifest duty of the Navy to strive to attain that state.

"To ask for guns which may all fire at the same range and to ask to have that range as great or greater than that of any possible or probable enemy is, it is true, an effort along competitive lines but this effort is a perfectly justifiable one. The country does not pay the Navy or its officers and men for inferior performance of duty. It pays them for the best they can produce and if they fail in any respect to strive to attain the efficiency for which they are paid, they are unworthy of the cloth they wear. It does seem is if the public might, through friendly co-operation of an American press, be led to understand what the ideals of the naval profession are in this respect—service to the country through the efficiency of the Navy it supports and nothing else."

THE BREAKING DOWN OF AMMUNITION.—In an interesting lecture delivered at the Aeolian Hall, on Wednesday last, Mr. F. N. Pickett gave a brief account of the work done by his firm, Messrs. F. N. Pickett and Son, in disposing of the vast quantities of Allied and German ammunition left on the dumps in Northern France and Belgium at the termination of the war. As a result of this work, which has been carried on for about three years, and is now, we understand, completed, some 350,000 tons of material, consisting mainly of steel and other metals, has been rendered available for industrial purposes. About 5,000 employees have been engaged on the work in ten large depots, and about 1,000,000 shells, 500,000 grenades and 750,000 fuses, weighing roughly 20,000 tons, have been dealt with per month. The first step in breaking down high explosive shells, the lecturer explained, was the rather dangerous operation of removing the fuses, but this was accomplished by placing one shell at a time in a rough cubicle buttressed with sand bags and railway sleepers and arranged so that the fuse could be unscrewed by a worker outside the cubicle using special tools. After the fuse had been removed, the charge was generally either washed out with hot water or burned out, according to its character, but in the case of some German 42-cm. shells, the charge of T.N.T. was removed and kept. To enable this to be done the shells were cut in half in a lathe set up inside an explosion-proof cubicle and operated from outside, the operator watching the progress of the work through a series of mirrors. Large quantities of cordite were burned harmlessly on the seashore in batches up to forty tons, but the stock of various noxious gases, of which 36,000 tons of cylinders and shells had to be dealt with, was more difficult to dispose of. The methods adopted for this purpose were the result of extensive experimental and research work and naturally differed according to the nature of the gas to be dealt with. Space will not permit us to refer to all the processes used, but, as an example, we may explain the method employed for dealing with the British mustard-gas shells. These were originally filled through a small hole in the side which was afterwards closed by a soft-iron tapered plug. For emptying these shells, the iron plug was driven in with a hard-steel tubular drift making a driving fit in the hole, and having the bore of the

tube filled up with paraffin wax. The drift, which thus closed the hole formerly occupied by the iron plug, was left in position, and the shells so prepared were placed in trenches with the plug downwards and covered with wood, which was fired. The heat from the fire, of course, melted the wax in the plug, and allowed the gas to escape, and being combustible it was harmlessly consumed in the fire. It is hardly necessary to add that the fuses and explosive charges of the shells were removed before the wax-filled plugs were inserted. The methods of handling shells containing phosgene and the mixture of chlorine and phosgene known as "white star" gas, were equally ingenious and effective. Large quantities of chemicals useful for manufacturing processes and as fertilizers have also been recovered, but the lecturer did not deal in detail with this part of his work. In conclusion, he expressed satisfaction that the whole area occupied by the British Armies in France and Belgium had now been cleared up, and this satisfaction will doubtless be shared by the majority of his countrymen.—*Engineering*, 27 July, 1923.

A NEW POWDER.—The successful development of a new powder, flashless, smokeless and non-hydroscopic (not affected by moisture), was announced on June 21 by the War Department. It has all the driving power of the powder now in use, experts say.

They assert that the new explosive may be exposed indefinitely to any atmosphere saturated with moisture without effect on its properties. In tests it has been completely submerged in water and then found free from moisture. The service powder now in use, because of its tendency to absorb moisture, must be packed in waterproof containers. If these containers are in any way defective, deterioration is almost certain.

The new powder was developed for use in 75-millimeter guns, but has been modified to include charges for heavier artillery. It will also be adapted to the rifle and machine gun and will eventually replace entirely for all arms the powder now in use.—*Current History*, August, 1922.

## NAVIGATION AND RADIO

NAVY WILL OBTAIN PACIFIC OCEAN DEPTHS.—The U. S. S. *Milwaukee* will leave Puget Sound in time to arrive for the Pan-Pacific Scientific Congress in Australia for the Sydney meeting on August 23, 1923. The *Milwaukee* is fitted with the most improved type of sonic depth finder, and the commanding officer has instruction to make a chart of soundings from Puget Sound to Sydney via Oahu, Samoan Islands, Fiji Islands, and New Caledonia. The commanding officer, Captain William C. Asserson, has been appointed a delegate to this congress and will present his chart of soundings on the trip down at a meeting of the congress. The fact that these data have been so recently obtained will, it is thought, have a good effect on the congress. The hydrography covered by this trip is very little known, but it is thought that great depths will be encountered, and it is hoped that the *Milwaukee* will be able to obtain these great depths with accuracy with her sonic depth finder. Part of the ocean floor to be traversed is supposed to be ooze, which may make it difficult to get a sharp reflection of sound. This trip is of great scientific value and is particularly interesting to this congress, which has in its agenda the subjects of hydrography and oceanography.—*Army and Navy Register*, 21 July, 1923.

TEACHING RADIO TO SLEEPING STUDENTS.—Further reports from the naval air station at Pensacola, Fla., on the success that has been attained in teaching radio code to student aviators in their sleep give interesting information on the progress of this novel and useful experiment. In

fact, it may be said that the experimental stage in the trials has been past, and the method has become standard as a means of saving students from failure in the course. When the test was started twelve students were unsatisfactory in their progress in radio code. After two nights during which radio code was sent to the students in their sleep, only two of the students were unsatisfactory, and these two men had left before the experiment was finished, professing disbelief in it. The procedure has been to have the students sleep on the tables in the radio room where the code is taught in the regular school periods. Operators send messages at varying speeds all night. The students concentrate on the messages that are sent through until they drop off to sleep. To quote a report on the subject:

"It is very interesting to watch the students during one of these night periods. If the operator intentionally and continuously makes errors in sending, the students will toss around most unusually in their sleep. If the sending stops or the rate of sending changes appreciably, it is sure to disturb them and in most cases will arouse them. Even in the midst of their deepest slumbers, the call 'S. O. S.' at a different rate of speed will awaken them instantly."

It is planned to secure electrical sending machines which will send all night and do away with the necessity for an operator for future classes.—*Army and Navy Register*, 21 July, 1923.

Frequency Measurement in Electrical Communication.—J. W. Horton, N. H. Ricker and W. A. Marrison considered the need for increased accuracy in measuring any frequency between one and several million cycles per second and described a tuning-fork apparatus with vacuum-tube equipment for this class of work which has given excellent results. Data were given upon the effect of temperature, potential of power supply and circuit constants upon frequency, determined either by comparisons with a constant frequency or by ascertaining the absolute value of the frequency. The ratio of the rate of the fork to that of a carefully modulated clock has been found to be constant within six parts in one million over considerable periods of time. For measuring the frequency of any alternating current used in electrical communication in terms of the known frequency there has been developed an arrangement of harmonic producers and a special modulator-rectifier circuit for combining known harmonics of the base and comparing other frequencies with them.

Following the presentation of this paper, Mr. Horton stated that an agreement as close as twenty-five cycles in one million had been observed between the transmitted standard frequency of the United States Bureau of Standards and that of the apparatus described by the authors.—*Electrical World*, 7 July, 1923.

Shanghai to Have U. S. Radio Station.—Peking, July 17.—It is understood the Federal Wireless Telephone and Telegraph Company has completed negotiations with the Chinese Government and will return in the autumn to begin construction of the main wireless station at Shanghai. The negotiations throughout have been conducted against the greatest opposition from the Japanese, who desired to enforce the Mitsui Company's thirty-year monopoly.

The Navy Department has notified the Mitsui Company that it must complete the Tungchow plant, which it has been building for four years, by July 31. If the plant is successfully completed the Chinese Government will assume ownership, but if the plant is not successful Peking may cancel the Mitsui contract.

At any rate, China on August 1 will be inclined to consider the monopoly question settled. The long delay in vindicating the open-door policy is

due to the chaotic condition of the Government and the opposition of the Japanese, not to the unwillingness of the Chinese to carry out their contract. —*Philadelphia Public Ledger,* 18 July, 1923.

CHINESE WIRELESS RIGHTS IN MUDDLE.—Peking, July 30.—The trans-Pacific radio communications muddle, including China's rights, which were guaranteed by foreign powers at the Washington conference, again have become vexing. A statement on the situation may be made by R. H. Schwerin, president of the Federal Wireless Company, a subsidiary of the Radio Corporation of America, following his scheduled arrival in San Francisco from Peking on August 9.

Schwerin departed from Peking quietly without disclosing his plans. Recent activities of other radio companies, backed by other foreign powers, while the activities of his own companies have been blocked, are believed to have made it advisable that Schwerin holds a personal conference with Secretary of State Hughes.

### French Effect Coup

While the British, Japanese and American Governments are engaged in a three-cornered controversy in Peking as to whether the Marconi, Mitsui or Federal companies, respectively, shall have the exclusive right to erect and control a Chinese government wireless system, the French have suddenly completed a station at Yunnanfu.

Completion of another powerful French radio station at Saigon, and announcement from the Mitsui Company that it has completed a station at Shanghai which will commence operations at the end of July has increased the confusion over radio rights. The French Company activities have not progressed beyond building an experimental receiving station at Shanghai.

### Proposes Equal Rights

The newly arrived Japanese Minister to China has proposed that the three Governments participate equally in Chinese wireless contracts. America and Great Britain have not sent their answers to the proposal.

Meanwhile, China is without a President or Premier, and Japanese Minister Yoshizawa cannot present his credentials, and as a result lacks official standing.—*Baltimore Sun,* 30 July, 1923.

## MISCELLANEOUS

SIGN TURKISH PEACE.—Lausanne, July 24.—The Lausanne Peace Treaty formally re-establishing peace between the European Powers and Turkey was signed today.

The general treaty, formally ending the state of war, was signed by Great Britain, France, Italy, Japan, Greece, Rumania and Turkey.

Jugoslavia announced at the last minute her refusal to sign on the ground that to do so would be harmful to her national interests. The treaty distributes the Ottoman debt among countries like Jugoslavia which acquired parts of the former Ottoman empire.

Jugoslavia maintains that she annexed her former Turkish territory as a result of the Balkan Wars and not as a consequence of the general European or Turko-Greek Wars. She prefers therefore to abide by the treaties of London and Bucharest which fixed the political status of the Balkans. She has agreed to negotiate directly with the European Powers regarding her possible responsibility in connection with the Turkish debt.

The general treaty comprises 143 articles, divided into five parts—political, financial, economic, communications and general clauses.

The commercial section stipulates the application of the Ottoman tariff,

inaugurated in 1916, multiplied by a co-efficient corresponding to the depreciation of the Turkish currency.

Europe's task of making ultimate peace with Turkey, which required eight months of negotiations, was immensely complicated because Turkey, although vanquished in the World War as an ally of Germany, came to the council table at Lausanne as a victorious nation. Turkey's reconstructed armies, consumed with patriotic fervor and desirous to shake themselves free from foreign invaders had completely routed the Greek forces and driven them to the shores of Asia Minor.

* * * * * * * *

Underlying all of the weary, endless, daily struggles, one thought dominated all discussion. It was that Turkey should be brought back to Europe and not be forced by ostracism to cast her lot with Mohammedan people of the East—Egypt, India, Persia, Arabia and Afghanistan.

By the restoration of eastern Thrace to her sovereignty, Turkey becomes the bridge between the East and the West; she joins the League of Nations and enters the European concert of peoples on the footing of equality.

Some of the features of the treaty:

Constantinople goes definitely to Turkey.

All foreign troops will be withdrawn.

It makes peace between Greece and Turkey.

It permits the patriarch of the Greek Orthodox Church to remain in Constantinople.

It launches one of the most stupendous, and in some ways the most cruel, human movements in history by its compulsory exchange of population, the Greeks in Turkey returning to Greece, and the Turks in Greece returning to Turkey.

It fails to solve the Armenian problem. Armenians being obliged to seek refuge in neighboring lands like Syria or to find a new haven in Southern Russia.

It reduces Turkey's size by its recognition of the detached mandated States like Syria, Mesopotamia and Palestine.

With one stroke of the pen it rids Turkey of judicial capitulation such as China vainly sought to accomplish for itself at Washington and which Japan achieved only after two decades of struggle.

In only one way is Turkey treated differently from other countries; foreign legal advisers will be empowered to receive complaints relating to arrests and imprisonment of foreigners.—*Philadelphia Public Ledger*, 23 July, 1923.

THE NETHERLANDS NAVY BILL.—First introduced in November, 1921, the Dutch naval program has remained in suspense ever since that date, owing, it is believed, to reasons of finance. It is now reported, however, that the Cabinet, acting on the advice of a Commission appointed to report on the Bill, has decided to present the measure to Parliament without further delay, in order that it may come into force on January 1. This decision has led to the resignation of the Finance Minister on the ground that it will impose an excessive burden on the shoulders of the Dutch people.

The program calls for the construction of many new vessels, most of which are to be allocated to the East Indian Marine for the defense of the valuable colonies in that part of the world. If it is adopted, the East Indian establishment will eventually comprise four cruisers, twenty-four destroyers, thirty-two submarines, four submarine minelayers, four gunboats, nine minelayers, one submarine parent ship, and several auxiliary vessels, other defensive equipment including 4,500 mines and 108 aeroplanes.

Tandjong Priok, in Batavia, will be the principal base for this fleet, with an emergency base in the Riouw archipelago and another in Soerabaya. The harbor of Macassar is also to be fortified. A certain proportion of the ships required are already in existence, but the major part of the establishment has yet to be constructed. The estimated expenditure over a period of six years is 184,685,000 million guilders for vessels and aircraft and 77,898,000 million for bases.

It is interesting to note that the auxiliary naval base projected in the Riouw archipelago is south-east of Singapore. Dutch strategists freely admit that the naval force foreshadowed in this program could not of itself defend the East Indies from attack by a great Power. They argue, however, that Holland would not have to fight single-handed if she were assailed by such a Power. So valuable are the East Indian islands both from the economic and the strategical points of view that if a war occurred in the Pacific there would be a desperate race among the belligerents to seize them; and here, as one Dutch writer pointed out, "is explained the apparent contradiction that the Indies can be held permanently only with the aid of an ally and yet must be able by their own strength to repulse the initial attack. Only in this way," he adds, "can we be sure that the help tendered by an ally would not arrive too late." There is said to be an excellent prospect of the bill getting safely through the Netherlands Parliament.—*Naval and Military Record*, 25 July, 1923.

TOKIO UNABLE TO SPEND BOXER FUND ON CHINESE STUDENTS.—Tokio, August 12.—The success of Japan's plan of cultivating Chinese friendship by imitating the United States in expending Boxer indemnity funds for the benefit of Chinese education is threatened by the refusal of Chinese students here to "disgrace ourselves by acceptance of Japanese assistance."

Since April, Japan has been trying to give $200,000 for the support of 3,000 Chinese students studying in Japan, most of whom have become destitute since the penniless Chinese Government ceased to send them remittances.

The majority of the students, however, prefer poverty rather than dependency upon Japan. The money remains untouched, and Japan is experiencing the sensation of a Good Samaritan whose efforts are not appreciated.—*Philadelphia Public Ledger*, 13 August, 1923.

## CURRENT NAVAL AND PROFESSIONAL PAPERS AND ARTICLES

"Counting Midshipman and Cadet Service for Longevity Pay."—*Army and Navy Journal*, 21 July, 1923.

*"Diesel and Oil Engine Handbook."—By Julius Rosbloom. Published by the Technical Publishing Company, Los Angeles, Cal. 376 pages.*

The author of this work, who is credited as being the author of numerous technical books, has here written a practical book of instruction and ready reference on oil engines of high compression and low compression, compressors, pumps and such equipment necessary in oil engine installation and Diesel electric drive. The work covers both land and marine engines, is profusely illustrated and each chapter is followed by a series of questions and answers, tables and formulas. The information contained in the book is of a strictly practical nature and written in simple language suitable for the person with limited education. The compilation has been made possible by the co-operation of engineers of highest prominence in the field and much of the data has been culled from leading technical publications in the United States and other countries.

Some of the leading chapters deal with the following subjects: Horsepower Calculation, Indicator Practice; Air Equipment, Cylinders, Valve

Arrangement; Pumps, Governors and Fuel Valves; Fuel and Lubricants; Detail Description of Engines; Diesel Electric Drive; Rules for Licensing of Engineers on Motorships.—*Nautical Gazette*, 4 August, 1923.

"German Steam Boiler Designed for 850 lbs. Pressure."—By Bruno Schapiro, *Power*, 31 July, 1923.

"Starting and Loading an Electric-ship-Propulsion Turbo-Alternator."—Lieutenant Commander A. M. Charlton, *Power*, 14 August, 1923.

"The Disintegration of Cement in Sea Water."—Wm. G. Atwood and A. A. Johnson, *Proceedings, A. S. CE.*, August, 1922. A thorough treatment of subject, "Two Flywheels as Compared with One for Interval Combustion Engines."—*Power*, 24 July, 1923.

"The Modification of Wind-tunnel Results by Wind-tunnel Dimensions." Max M. Munk, in *Journal of the Franklin Institute*, August, 1923.

"An Impulse Electric Motor for Driving Recording Instruments." W. F. Joachim. Summary:

The working parts of the motor are few and simple. They consist of four spool type field coils, a reciprocating armature, a ratchet wheel and two pawls. The field coils, operating in pairs, alternately pull the armature from one pair of pole faces to the other pair. This reciprocating motion is transmitted to the ratchet wheel through the two pawls, motion in either direction producing a positive advance of the wheel. Rotation of a very regular character is thus secured.

The motor is 1⅜ inches long, 1 3/16 inches wide and ⅞ inch high, with a volume of 1.43 cubic inches, and a weight of .165 pound (75 gms.). It produces approximately $6.0 \times 10^{5}$ H.P., with an efficiency of 1.0 per cent. The speed range is from 0 to 35 R.P.M., the torque being .234 pound-inch (269.6 g.-cm.) at the lower speeds with 8 volts applied.

Due to its small size and light weight, its inherent slow speed and property of absolute synchronization, the motor is particularly well adapted to aircraft instrument work. Application of this type of power source may also be made to automatic recording instruments of all kinds, to indicating devices requiring absolute precision of movement, and to remote control work.—*Journal of Franklin Institute*, August, 1923.

# NOTES ON INTERNATIONAL AFFAIRS

FROM JULY 23 TO AUGUST 23

PREPARED BY

ALLAN WESTCOTT, Professor, U. S. Naval Academy

## GERMANY AND REPARATIONS

BRITISH CONDEMN FRENCH POLICY.—The British draft for a joint Allied reply to Germany regarding reparations, which was submitted to the Allied powers and the United States in July, was in general approved by Italy, but was rejected by France and Belgium in notes sent to the British Foreign Office early in August. The French and Belgian replies not only failed to fall in with the British proposals but practically disregarded them, consisting instead of arguments in justification of the course taken by France and Belgium and in support of special priority claims upon German payments.

After some division of opinion within the British Cabinet, due to the opposition of "die hard" Conservative members to a break with France, a decision was finally reached to publish the correspondence on the subject and definitely present the British line of policy. Lord Curzon's note to France and Belgium, delivered on August 11 and made public the following day, argued that the Ruhr occupation was illegal, although suggesting that the point be submitted to arbitration. The note objected to settlement of the amount of reparations by the Reparation Commission, on the ground that the commission had become the mere instrument of Franco-Belgian policy. Finally the note stated that the British Government adhered to the plan of former Premier Bonar Law, under which Great Britian would expect to gain from Germany and her debtor Allies only enough to meet British obligations to the United States.

The British note read in part as follows:

"His Majesty's Government never contemplated and do not contemplate, that Germany should be relieved of all reparation payments. They are determined that Germany shall pay to the maximum of her capacity. What that maximum may be should be decided by an impartial inquiry. It cannot be ascertained by casting up amounts Germany's creditors would like to receive.

"To ask more than Germany's capacity can only destroy assets which Germany would be able to offer the Allies. To force liquidation is not the most profitable way of making recovery from a debtor with resources.

"It is admitted that Germany can only make substantial payments if, by restoration of her finances and stabilization of her currency, she secures a budget surplus available for reparations. Moreover, this surplus must be in a form which can be made available for external payments over the

foreign exchanges. External debts cannot be paid by the collection of depreciated paper marks.

"In the view of his Majesty's Government, forcible interference with the economic life of Germany, even if consistent with the Treaty of Versailles, cannot assist in the necessary restoration. Not only will it prevent realization of any surplus for reparations but, by intensifying the disorder of German finance and currency, will have the gravest reactions on trade.

"His Majesty's Government, therefore, regard as doomed to failure the method pursued by the French and Belgian governments to secure reparations. Despite the wholesale seizures the occupation of the Ruhr has produced, at great cost, less receipts for the Allies, notably of coal and coke, than were forthcoming the previous year. Moreover, his Majesty's Government feel that the resulting situation involves a great and growing danger to the peaceful trade of the world, and not the least to that of Great Britain.

"The Government regard the continuance of the present position as fraught with gravest risk, both economic and political. They consider an impartial fixation of Germany's liability at a figure not inconsistent with her practical power of making payment as a matter of great urgency, and they have suggested what appears to them appropriate means to this end.

"When steps have been thus taken to ascertain the real value of the asset, represented by German reparations, and to secure its realization without further depreciation, his Majesty's Government will be ready to deal as generously as circumstances permit and in the light of their respective capacity to pay with the debts due to Great Britain by her Allies.

"They cannot, having regard to Great Britain's heavy material losses during and since the war, and to future tax burdens on its trade, admit that other countries are justified in claiming that the agreed percentages of reparation payments should now be further modified or changed in the order of priority.

"But they remain prepared to ask for no more in respect for the very large sums due by their Allies than will, together with the reparation payment by Germany, meet the British war debt to the United States Government."

GERMANY'S ABILITY TO PAY.—Washington, July 20.—Germany at present can pay nothing, according to the conclusions reached by the Institute of Economics in its report on Germany's capacity to meet reparations demands just completed by Harold G. Moulton and C. E. Maguire and scheduled to appear from the press of a New York publisher on September 1.

The report declares it to be the conclusion of the Institute's investigators that since the armistice Germany, in fulfillment of reparations obligations, has parted with goods, money, property, and securities worth to her not less than 26,000,000,000 gold marks, or about $5,188,000,000. This is less than Germany contends, but more than France admits, that the Germans have paid. The Allies, according to the Institute's report, acknowledge the receipt, roughly, of $2,000,000,000. On the other hand, Germany claims credit for payments amounting, roughly, to $11,000,000,000.

The discrepancy between these figures is explained, according to the Institute's report, by the fact that the allied powers refused to allow credit for many of the largest items of German delivery. After declaring that Germany "at present can pay nothing," the Institute asserts that "whether she will be able to pay in the near, or even distant, future depends on circumstances over which she has no direct control." It declares that most of the values surrendered by Germany in fulfillment of reparation obligations have been from capital and not income, and that "she has practically nothing left"; that Germany has no more capital to send across the border, no income, except paper marks, which the Allies will not accept, and that

the Allies cannot collect anything from Germany so long as they refuse to permit Germany to earn, by foreign trade, money acceptable to them. —*New York Times*, 21 July.

FALL OF CUNO CABINET.—Withdrawal of support by the United Socialist Party in Germany forced the resignation of Chancellor Wilhelm Cuno and his cabinet on August 12. A new middle coalition cabinet was subsequently organized by Dr. Gustav Stresemann, with support of the United Socialist, Clerical, People's and Democratic parties.

The Socialist revolt against Cuno called for more aggressive measures to remedy internal economic difficulties, entry into the League of Nations, and more active foreign policy.

## UNITED STATES

AGREEMENT SIGNED WITH MEXICO.—On August 15 Mexican and American representatives signed the records of the conference which has been going on for some time in Mexico City, the records embodying an agreement designed to make possible the resumption of diplomatic relations between the two countries. Two claims conventions were drawn up covering American claims against Mexico for damages during the revolutionary period from 1910-20 and Mexican claims against the United States resulting from the Pershing expedition and the occupation of Vera Cruz. These must be submitted to the American and Mexican Senates for approval.

The conference records contain Mexican Government interpretations of the subsoil-petroleum and agrarian legislation acceptable to the American delegates, and an expression of the Government's intention to follow these interpretations in good faith. Under the subsoil-petroleum section American oil companies' rights to suboil acquired prior to the going into effect of the Queretaro constitution on May 1, 1917, remain intact. After that date the provisions of the Queretaro constitution relating to the subsoil prevail, although the non-retroactivity of these provisions, notably the much mooted Article 27, is firmly established.

Nothing is known officially relative to the subsoil-petroleum rights of Americans who acquired lands prior to May 1, 1917, but who did not explore or announce intention to exploit their lands for oil. It is understood the Mexican Government is unwilling to assure them their rights, but the United States delegates specifically reserved the rights of these individuals.

Under the agrarian section of the understanding American rights acquired prior to the 1917 constitution remain intact under the laws then in force and the provisions of the constitution of 1857, but lands acquired since 1917, it is agreed, are subject to the provisions of the later constitution relative to the division of huge estates and also to subsequent agrarian reform laws.

BRITISH VIEW OF TWELVE-MILE LIMIT.—Washington, July 23.—Acceptance by the British Government of the Hughes proposal for stopping rum-running on the Atlantic coast through the establishment of a twelve-mile limit of search is expected by High Administration officials as a result of the favorable report upon it just made by the British Inter-Departmental Committee examining the question.

A tangible idea of the contents is indicated in the recent letter of Lord Birkenhead in which he suggested acceptance of the twelve-mile limit for

liquor search only, the three-mile legal line otherwise remaining, in a convention to be renewed yearly and to contain a return concession by the United States permitting British ships to carry sealed liquors for the home-bound voyage.

TREATY WITH TURKEY.—Negotiations at Lausanne between Joseph C. Grew, American Minister to Switzerland, and Ismet Pasha as representative of Turkey, were ended on August 6 by the signing of two treaties, one general and the other relating to extradition. The general treaty provides that American ships and aircraft of commerce and war will secure freedom of the Straits in accordance with the terms of the Straits convention, though the United States has not signed this convention and assumes no responsibility regarding its application. The difficulty over claims is settled by an agreement to leave them outside the treaty for separate negotiations to begin twenty days later. The treaty abolishes the capitulations, but provides that Americans in matters of personal status shall be subject only to American courts. Americans may travel and reside in Turkey, and engage in pursuits permitted by law to foreigners. Complete liberty of commerce and navigation is provided, and the most favored nation treatment in regard to import and export duties and other restrictions on trade.

PACIFIC TREATIES RATIFIED.—Washington, August 17.—The two most important treaties negotiated at the Washington Conference of 1921 became effective today with the exchange of ratifications at the State Department by representatives of the signatory powers.

One is the Five-Power Treaty binding the United States, Great Britain, France, Italy and Japan to a reduction in naval establishments, which, for ten-year period, fixes a ratio of 5-5-3 for the capital ship strength of the United States, Great Britain and Japan and of 1.75 for that of France and Italy. The other is the Four-Power Treaty concluded by the United States, Great Britain, France and Japan relating to their insular possessions and dominions in the region of the Pacific.

The exchange of ratifications, consummating that part of the work of the Washington Conference, took place at noon. The last signature was placed on the official documents at 12:12 o'clock. At that hour the Anglo-Japanese Alliance ceased to exist. The Four-Power Treaty expressly stipulates that it "shall take effect on the deposit of ratification, which shall take place at Washington, and thereupon the agreement between Great Britain and Japan, which was concluded at London July 13, 1911, shall terminate."

Reduction of the American Navy in accordance with the terms of the Five-Power Treaty will begin immediately, according to announcement made by Theodore Roosevelt, Acting Secretary of the Navy, after the final exchanges today. As soon as the Navy Department had been notified by the State Department that the treaty was considered in full effect orders were sent whereby twenty-eight American capital ships, with an approximate tonnage of 750,000, including ships under construction at private and at navy yards and old ships, will be dropped from the United States Navy.

The document of exchange on the Naval Treaty signed today included the reservation of the French Government, stating that it was the understanding of that Government that the treaty was to apply only to naval craft expressly stipulated in the agreement, and to no others. The *procés-verbal* after stating that the exchange took place in conformity with Article 24 of the treaty itself, continued:

"'The French Government considered and always has considered that the ratio of total tonnage in capital ships and aircraft carriers allowed to the several contracting Powers do not represent the respective importance of the maritime interests of those Powers and cannot be extended to the categories of vessels other than those for which they were expressly stipulated.'"

The Four-Power Treaty contained the reservation which was adopted by the United States Senate at the time that it approved the treaty, which read as follows:

"The United States understands that under the statement in the preamble or under the terms of the treaty there is no commitment to armed force, no alliance, no obligation to join in any defense."

## LEAGUE AND WORLD COURT

ARMS REDUCTION PLAN.—Paris, August 8.—The draft of a treaty for "Mutual International Assistance and Armament Reduction" has finally emerged from discussions of the League of Nations' Mixed Commission for Reduction of Armaments.

The draft will be presented to the representatives of fifty-two nations at the league assembly next month at Geneva. If it is not changed or rejected there the nations which then decide to sign it—it will be submitted to the respective governments—will undertake the following terms:

Any nation may contract defensive alliances as it sees fit just as if there were no league treaty of mutual guarantees. These alliances must next be submitted to the league council for approval as being purely defensive. If they are not approved, that particular nation gets no further into the mutual guarantee system until its defensive alliances are revised to suit the council.

The vote on the draft was not unanimous, but by majority ballot, and there were several objections. France made a reservation that military agreements be exempted from the above provision because their value consisted in secrecy. Italy made reservations in all the three points. She points out the Austro-German alliance that operated in 1914 was such a "defensive" one.

After the alliances have been accepted by the council the contracting nation, the treaty provides, estimates the least armament it needs in consideration of its alliances. This estimate is submitted to the council. When that body has received the estimates of all the signatories of the treaty it may modify them in accordance with a general scheme of armament allotment. The contracting nations must either accept this allotment or quit the mutual guarantee system.

At this point several experts made reservations that their governments might not permit an international majority to prescribe their defensive armament.

### CECIL IDEA HELD NULLIFIED

This scheme is a composite of the ideas of Lord Robert Cecil and of Lieutenant-Colonel Requin, French military expert, who recently declared that in the next war France would be first across the Rhine.

The Italians say the original Cecil idea has been nullified. He intended to replace small groups with a single mutual guarantee, but the Italians say instead of being replaced the new system will simply seek to restrain them. On the whole, the French are well satisfied, they say, because it leaves them liberty of action. The Japanese are wondering if the treaty does not commit their country too deeply to something.

Lord Robert himself admits he is attempting to provide working apparatus for Article 10 of the league covenant, which guarantees inter-

national security and which was the chief reason for rejection of the league by the United States Senate.—*New York World*, 9 August.

WORLD COURT RULES AGAINST GERMANY.—The Hague, August 17.—At a public sitting of the World Court today judgment in the case of the steamer *Wimbledon*, involving the navigation of the Kiel Canal, was pronounced.

The decision, which was drawn up by a majority of the court composed of nine judges, was that the suit was validly submitted and that the German authorities were wrong in refusing to allow passage to the *Wimbledon*. The German Government is in consequence declared to be under obligation to make good the damages sustained, estimated at approximately 140,749 French francs.

Judge Anzilotti of Italy and Judge Huber of Switzerland were unable to agree with the majority of the Court and availed themselves of the right of delivering separate opinions. Professor Schücking, the German National Judge, appointed especially for this case, the first German Judge to sit on the Court took the same course.

As will be remembered, the British steamer *Wimbledon*, chartered by a French company and loaded with a cargo of munitions consigned to Poland, presented itself at the entrance to the Kiel Canal en route to Danzig, and was barred from passage by the Germans, who justified their refusal by the German regulations regarding neutrality. The Versailles Treaty states that the Kiel Canal shall be maintained free and open to the vessels of commerce and war of all nations at peace with Germany on terms of entire equality.

In reply to a protest made on the basis of this provision the German Government stated that as the treaty of peace between Poland and Russia had not been ratified, the transit of war materials destined for either of these countries through German territory was forbidden. A preliminary peace treaty between Poland and Russia, however, had been ratified, limiting the frontiers generally, and the final peace treaty between those countries had been signed, but not ratified.

The judgment is based upon the general rule contained in Article 380 of the Versailles treaty, the effect of which, in the Court's opinion, is that the Kiel Canal has ceased to be an inland navigable waterway, the use of which by vessels of powers other than the riparian State is left to the discretion of that State.

By stating that the Kiel Canal shall be maintained open to the vessels of nations at peace with Germany, the Versailles Treaty, it was held, contemplated the possibility of a future war in which Germany would be involved. If the conditions of access to the canal were also to be modified in the event of a conflict between powers remaining at peace with Germany, the treaty would not have failed to say so, it is declared, and the omission of this statement may be considered as intentional.

The judgment refers to the American Presidential proclamation of November, 1914, for the use of the Panama Canal in the World War, express provision being made for the passage of men of war of the belligerents as well as prizes of war, and no restriction being placed upon the passage of merchant ships of any nationality carrying contraband. The proclamation of May, 1917, issued after the United States had entered the war, which forbade the use of the Panama Canal by enemy ships, whether public or private, was also cited.

The judgment concludes that as it has never been alleged that the neutrality of the United States before its entry into the war was in any way compromised by the fact that the Panama Canal could be used by belligerents' vessels, the case of the Kiel Canal is analagous, it is declared, and the argument is invalidated that Germany's neutrality would necessarily

have been imperilled if the authorities had allowed the passage of the *Wimbledon* because it was carrying contraband consigned to a State then engaged in armed conflict.—*New York World,* 18 August.

WORLD COURT DENIES JURISDICTION.—The Hague, July 23.—The Permanent Court of International Arbitration today, by a vote of seven to four, declared itself incompetent to pronounce an opinion in a dispute between a member of the League of Nations and a non-member, without the latter's consent.

The non-member in this case was Russia, which refused to recognize the Court's jurisdiction in the Soviet Government's controversy with Finland over the Treaty of Dorpat, which as interpreted by Finland obligates Russia to grant a certain measure of autonomy to Eastern Karelia, situated along the frontier of Finland and inhabited by a population belonging to the Finnish race.

These provisions relating to autonomy were inserted in the peace treaty between Finland and Soviet Russia and in a declaration made by the Russian delegation in the protocol of signature.

The Court observed that this point was at the present moment the subject of acute controversy between Finland and Russia, and for this reason to give an answer to the question or even to form an advisory opinion would be equivalent to settling the dispute.

It also observed that a reply to question submitted would have made an inquiry into the question of fact indispensable, which inquiry the Court would have found difficult to carry out without Russia's concurrence.

This is the first time that the World Court has adjudged itself incompetent to act on a case brought before it, and the Finnish agent in the proceeding, Rafael Erich, professor of international law and a former diplomat, is greatly chagrined, but the decision is generally held by legal experts here to demonstrate the Court's independence of League influences and its strictly juridical attitude toward its work.

There has been much speculation in international legal circles at The Hague, now crowded with eminent legal experts as to whether the Court could declare itself competent in a case which was undefended and where the defendant refused to recognize the World Court and the League of Nations.—*New York Times,* 24 July.

## RUSSIA

THE NEW SOVIET CONSTITUTION.—Washington, August 13.—The new Federal Constitution of Soviet Russia, adopted by the Central Executive Committee of the Union on July 6 last and now to be submitted to the All-Russian Congress, is so much a thing of checks and balances, nominal at least, that it should delight the heart of the professional constitutional lawyer. But it is inaccurate to say that this new Russian Federal Constitution closely resembles the Constitution of the United States, as has been claimed by some of the Soviet spokesmen.

For example, it appears that the judicial processes will not be so independent of legislative and administrative influences; again, there is merging of administrative and legislative powers in a way undreamed of in this country; still again, practically all power derives from the Congress of the Soviet Federation, whereas in this country the administrative power derives directly from the people. Finally, the central Government will have far-reaching power over the finances of the constituent states.

The Constitution is being set up for a federation which is composed of:

The Russian Socialist Federated Soviet Republic.
The Ukrainian Socialist Soviet Republic.
The White Russian Socialist Soviet Republic.

The Trans-Caucasian Socialist Federated Soviet Republic (which includes the Socialist Soviet Republic of Azerbaijan, the Socialist Soviet Republic of Georgia and the Socialist Soviet Republic of Armenia).

This federation of the four big Soviet republics is given the name in the new Constitution of the Union of Socialist Soviet Republics. The authority of the federation will extend over an area that touches the Black Sea on the west, the Arctic Ocean on the north, the Pacific Ocean on the east and dips down as far as Afghanistan on the south. It is an area that includes great shares of Europe and Asia and that is several times larger than the continental territory of the United States.

The Congress is to be composed of one representative for each 25,000 voters in the urban districts and one representative for each 125,000 inhabitants in the rural districts. The representatives in the Soviet Congress are to be chosen in the district Soviet Congresses. Where there is none, the representatives are to be chosen by the Soviet Congresses of the constituent republics.

Provision is made for special sessions of the Soviet Congress, but it is evidently the expectation of the framers of the constitution that it will not be in session for prolonged periods, and thus elaborate provision is made for the exercise during recess of its "supreme authority." When the congress is not in session its authority is to be exercised by the Central Executive Committee of the Union of Socialist Soviet Republics, or by the presidium of that committee—which is a sort of super-executive committee and acts when the full committee is not in session.—*Baltimore Sun*, 14 August.

# REVIEW OF BOOKS

## THE RUSSIAN NAVY IN WAR AND REVOLUTION, by H. Graf, Commander I. R. N. (Translated from Russian) Printed by R. Oldenbourg, Munich.

This book is a personal account by an officer in the Russian Navy, of affairs in that service from the beginning of the war in 1914 until the dissolution of the Russian Navy by the revolution. It is worthy of serious historical consideration. The author served most of the war as executive officer of the fine destroyer *Novik*. He writes from his own knowledge and experience of affairs in the Baltic Fleet, and from documents and recollections of officers of the Black Sea Fleet in regard to affairs in that force.

The first part of the book deals with operations against the external enemy up to 1917, when the revolution broke out. During this time the Russian Navy was of course greatly outnumbered in the Baltic. It nevertheless was able to conduct many skillful and successful operations against the enemy. Its main object was ever the defense of the Gulf of Riga and the Gulf of Finland against attempts by the Germans to land troops behind the Russian armies along the coast. In this the Russian Navy was successful. Not until the revolution had demoralized the Navy did the Germans succeed in forcing the Gulf of Riga, or dare to make any serious attempts against the Gulf of Finland. The Black Sea Fleet, quite otherwise, held and exercised command of the sea in that area. It skilfully supported the right wing of the Russian Army in the Caucasus; it soon seriously injured and contained the *Goeben* and *Breslau* in Constantinople, as well as rendering ineffective the ships of the Turkish Navy.

It can thus be seen from the book that the Russian Navy, while from its size and position had no vital mission to carry out, nevertheless, did, in the early part of war, what it had to do, and did it in a thoroughly satisfactory manner.

The second part of the book concerns itself with what happened in the Navy from the beginning of the February revolution up to its final collapse as a fighting force in 1918. The conditions and situations described seem literally unbelievable. Yet they occurred. How could that force so cohesive and disciplined in 1916 have suddenly fallen to pieces as it did? The answer must be found in Russian character and government.

These pages are well worth study. A clear exposé is given of the methods of the Revolutionists. Knowing as we do the expressed intentions of Moscow to foment revolution in all western nations, we might well be on the lookout against any similar methods being attempted in our service.

Fortunately we have at least one tremendous advantage over the Russians. Our men are intelligent, and not easily to be swayed by specious doctrine from Moscow. I would not like to think what would happen to any Red agitator who tried to sew seeds of sedition amongst our crews. But they would undoubtedly try it if they thought they could "get away with it." Let forewarned be forearmed!

The author speaks feelingly of the great difficulty that the Russian Navy had always experienced in obtaining seamen to man its ships. This problem is one with which we of the United States Navy can sympathize. A nation of large continental area, having small extent of sea coast, they found it very difficult to get properly trained men to man their ships. They utilized the conscription, and trained their men as best they could. *Most wanted some technical training that would serve them after leaving the navy. These trained men would not re-enlist.* There was not enough cruising at sea to train the men, to make seamen of them. And this lack was felt when the revolution arose. Seamen, with the seaman's external outlook would not have been so deeply disaffected. It is not in the seaman's nature to be disloyal to his service.

Here also we can learn a lesson.

The appearance of the book is not commensurate with its importance. Yellow paper cover, poor paper, full of misspelled words and grammatical errors, it shows itself what is, a translation into English, of a German translation of the Russian original. "Traduttore Traditore" very truly in this case.

Let us quote the final passage " . . . and so St. Andrew's flag is no more. Where it once waved now the Red flag flies; it has the color of blood, of civil war, of torture and treachery. Our ships, the pride of our former days, have been dishonored as the whole of Russia has been.

"It is death then? For these skeletons of ships it *is* death; but for the idea of the Navy it is but a long sleep. The time will come when . . . Russia rises from the dead, and the Navy will revive. And then on the masts of its new ships, St. Andrew's flag, white with a blue transversal cross, will wave again in the wind."

R. C. S., Jr.

THE ESSENTIALS OF TRANSFORMER PRACTICE, by Emerson G. Reed, published by D. Van Nostrand Co., New York, 1923. Price $3.00, 265 pages.

The author in his preface says: "In short the men for whom I am writing and hope to interest are engineering students and operating engineers." The author has produced a book that will be very helpful to engineers, but he has not produced a satisfactory text for students. Twenty-five separate articles on the various phases of transformer design, construction, and operation have been loosely tied together in book form. There is little in the way of a connected development of transformer characteristics from fundamental considerations, and in the whole book

only five transformer vector diagrams appear. On the other hand with its wealth of practical information it should be a valuable reference book for advanced electrical students and practicing engineers.

L. A. D.

## LA CAMPAGNE DE BRUIX EN MÉDITERRANÈE, MARS-AOUT, 1799, by Lieutenant de Vaisseau G. Douin, Paris, 1923. Published under the direction of the Historical Service of the French Naval General Staff.

REVIEW BY ALLAN WESTCOTT, PROFESSOR, U. S. NAVAL ACADEMY

This volume belongs to a series of notable historical studies promoted by the French Naval *État-Major,* in line with similar research undertaken by both the army and navy general staffs of other nations, and designed as a preparation for the solution of future naval problems. The principle involved in this method of preparation is sound, for the problems of the future can be solved only by intelligence and imagination *plus* a thorough understanding of the experience of the past. With the passing of Mahan, the value of such historical study is underestimated in American naval training.

The lessons from Bruix's campaign lie chiefly in his failures. In 1799, after the battle of the Nile and the isolation of Napoleon in Egypt, Bruix was sent from Brest to the Mediterranean with practically the whole French fleet. It was a brilliant strategic move, so secretly planned that for weeks the British Admiralty were kept guessing as to its objective. Even without the aid of Spain, Bruix had a superiority over the British in the Mediterranean. At the end of three months he returned to Brest after a cruise almost barren of results.

The reasons for this failure may be grouped under three heads. First, there was a belief that mere superiority in the scene of war would cause the enemy to vanish, without energetic pursuit and destruction. With St. Vincent and Nelson as opponents, the psychology of this was fatal. Second, there were efforts to make assurance doubly sure by securing the co-operation of the Spanish fleet. This led to friction, slowed down operations, and prevented aggressive action. Finally, the fault lay partly in the character of the French commander.

To quote the author: "With Bruix imagination prevailed over logic. When two ships collided in his squadron, his whole plan was changed without valid reason. . . . Had he held firmly to his plan, he could have captured in detail all of Nelson's squadron scattered between Malta, Naples, and Palermo. After that, what would have prevented his joining the Spanish at a predetermined rendezvous, and with the combined fleet striking a blow at Minorca? He would then have been waging that methodical warfare without which there can be no lasting results, and which alone could have saved Malta and perhaps Egypt. But no; at the moment of action his arm swerved, his will faltered. There was lacking

in him that firmness of purpose which was Nelson's in an eminent degree. His spirit was less solid, less steadfast. He valued a clever maneuver as equal to a victory, and realized only later that his cleverness got him nowhere. Bruix's mind lacked clearness. Rarely did he perceive at once the right thing to do. He dreamed of enterprises that remained chimerical, and let the real one slip through his fingers. He exhausted his force in marches and countermarches, spoiling one of the most admirable strategic surprises that naval history has recorded, to accomplish an operation that a division of frigates could have done."

OPERATIONS OF THE 29th DIVISION. Compiled by Major W. S. Bowen, C.A.C. The Coast Artillery Journal, Fort Monroe, Va., 1923. 6 x 9¼. 410 pp. Price $1.25.

This volume gives the operations of the 29th Division of the American Expeditionary Force, under the command of Major General Charles G. Morton, during the month of October, 1918, in the Meuse-Argonne sector. The period covered one of the most hard-fought campaigns of the Great War.

The book is a compilation of the reports of the officers commanding the various units in the division, from the division commander down to and including the platoon commanders. It contains also a complete record of the messages sent from and received at division headquarters, and the various field orders covering the operations of the division, including those of the First Army (U. S.) and the 18th Division (French). There is also an excellent map embracing the front occupied by the 29th Division, and showing in detail the country from Dannevoux to Verdun.

As these are the official reports, "written in the atmosphere of war, at a time when the writers had just concluded one offensive operation and were prepared to enter another," they are of special interest, not only to all who took part in these operations, but to the general student of the campaign as well.

In its completeness the book is not only an unusual record, but a valuable historical document. Altogether, it reflects great credit both upon the Division which with such thoroughness prepared the reports, and upon the compiler who with such care assembled them.

H. G. S. W.

# SECRETARY'S NOTES

**Membership** Present Membership, 4636. Changes since January 1, 1923: New Members, 187. Resignations, 74. Deaths, 20. Total Increase, 93.

**Subscription Rates** In order to bring the subscription rate more nearly in line with the cost of publication, the Board of Control has increased the subscription rate to $5.00 per year. A special rate of $3.50 per year is made to members only (not available to societies or organizations) in order that they may send subscriptions for the PROCEEDINGS to their relatives and friends. (Foreign postage 50 cents extra in all cases). Subscriptions are automatically discontinued at expiration.

**Bound Copies** For a number of years, members desiring bound copies of the PROCEEDINGS have been able to obtain these for a slight additional payment, recently amounting to $4.00 per year. The actual additional cost to the Institute is approximately $16.97 per member per year. The net loss of approximately $13.00 per member per year has been borne by the Institute. As the number of bound copies per issue is only seventeen, the Board of Control has decided to discontinue furnishing bound copies, effective 1 January, 1924.

**Foreign Postage** For a number of years members residing abroad have been paying fifty cents extra per year for foreign postage, which does not quite cover the additional cost to the Institute at the present time. Life members residing abroad have not heretofore made this payment. The Board of Control has decided that all classes of membership shall be treated on the same basis, and life members residing abroad will, therefore, be required to pay fifty cents per year for foreign postage, effective 1 January, 1924.

**Articles** The Institute desires articles of interest to all branches of the service, including the reserve force. Non-members as well as members may submit articles, and authors receive due compensation for articles published. Compact, well digested articles are more likely to be accepted for early publication. In accepting articles for publication, the Institute reserves the right to have such articles revised or rearranged, where necessary, in order to bring them up to the required standard of articles published in the PROCEEDINGS—the cost, if any, to be deducted from the compensation due the author.

**Reprints of Articles** Twenty copies of reprints are furnished authors free of charge. Additional copies to the number desired will be furnished at author's expense, provided request is made before going to press.

**Discussions** Discussion of articles published in the PROCEEDINGS is cordially invited. Discussions accepted for publication are paid for at approximately one-half the rate for original articles.

**Book Reviews** As soon as practicable after the publication of books on subjects of professional interest, the Institute aims to publish authoritative reviews of them.

**Address of Members** To insure the delivery of the PROCEEDINGS and other communications from the U. S. Naval Institute, it is essential that members and subscribers *notify the Secretary and Treasurer of every change of address without delay.* No responsibility can be accepted for failure to receive the PROCEEDINGS, where members fail to comply with this rule.

H. G. S. WALLACE,
*Commander, U. S. Navy, Secretary and Treasurer.*

# SPECIAL NOTICE

## Naval Institute Prize, 1924

A prize of two hundred dollars, with a gold medal and a life-membership (unless the author is already a life member) in the Institute, is offered by the Naval Institute for the best original article on any subject pertaining to the naval profession published in the Proceedings during the current year. The prize will be in addition to the author's compensation paid upon publication of the article.

On the following page are given suggested topics. Articles are not limited to these topics and no additional weight will be given an article in awarding the prize because it is written on one of these suggested topics over one written on any subject pertaining to the naval profession.

The following rules will govern this competition:

1. All original articles published in the Proceedings during 1923 shall be eligible for consideration for the prize.

2. No article received after October 1 will be available for publication in 1923. Articles received subsequent to October 1, if accepted, will be published as soon as practicable thereafter.

3. If, in the opinion of the Board of Control, the best article published during 1923 is not of sufficient merit to be awarded the prize, it may receive "Honorable Mention," or such other distinction as the Board may decide.

4. In case one or more articles receive "Honorable Mention," the writers thereof will receive a minimum prize of seventy-five dollars and a life-membership (unless the author is already a life member) in the Institute, the actual amounts of the awards to be decided by the Board of Control in each case.

5. The method adopted by the Board of Control in selecting the Prize Essay is as follows:

(a) Prior to the January meeting of the Board of Control each member will submit to the Secretary and Treasurer a list of the articles published during the year which, in the opinion of that member, are worthy of consideration for prize. From this a summarized list will be prepared giving titles, names of authors, and a number of original lists on which each article appeared.

(b) At the January meeting of the Board of Control this summary will, by discussion, be narrowed down to a second list of not more than ten articles.

(c) Prior to the February meeting of the Board of Control, each member will submit his choice of five articles from the list of ten. These will be summarized as before.

(d) At the February meeting of the Board of Control this final summary will be considered. The Board will then decide by vote which articles shall finally be considered for prize and shall then proceed to determine the relative order of merit.

6. It is requested that all articles submitted be typewritten and in duplicate; articles submitted written in longhand and in single copy will, however, receive equal consideration.

7. In the event of the prize being awarded to the winner of a previous year, a gold clasp, suitably engraved, will be given in lieu of the gold medal.

By direction of the Board of Control.

H. G. S. WALLACE,
*Commander, U. S. Navy, Secretary and Treasurer.*